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Three Approximate Methods for Estimating the Best Subset of GPS Satellites for Satellite Position Calculations

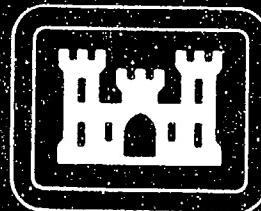
Michael A. Crombie

April 1990

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13. ABSTRACT (Maximum 200 words) Three methods approximating the best subset of four or five of N observable GPS satellites to be used for calculating spatial positions are evaluated. Position Dilution of Precision (PDOP) is used as the measure of effectiveness. Three GPS constellations are considered. The user spatial positions are taken from circular orbits ranging from 100 to 2400 nautical miles above the earth and from orbital inclinations ranging from 0 degrees to 90 degrees in 15 degree increments. Position finding estimates; Mapping; Computer programs; Approximation mathematics;						
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PREFACE

This study was conducted under DA Project A4762707A855, "Topographic Mapping Technology."

The study was conducted during the spring of 1989 under the supervision of Mr. Donald R. Barnes, Chief, Space Concepts Division, and Dr. Joseph J. Del Vecchio, Director, Space Programs Laboratory, U.S. Army Engineer Topographic Laboratories.

Col. David F. Maune, EN, was Commander and Director, and Mr. Walter E. Boge was Technical Director of the U.S. Army Engineer Topographic Laboratories during the report preparation.

LIST OF ABBREVIATIONS

PDOP	Position Dilution of Precision
GPS	Global Positioning System
BA	Basic system of 18 satellites
IP	Basic system plus 3 in-plane spares
EQ	Basic system plus 3 equatorial spares
NM	Nautical miles
LOS	Line-of-sight
GDOP	Geometric Dilution of Precision

THREE APPROXIMATE METHODS FOR ESTIMATING THE BEST SUBSET OF GPS SATELLITES FOR SATELLITE POSITION CALCULATIONS

INTRODUCTION

It was pointed out in a previous report¹ that an evaluation should be made of the loss of accuracy in Position Dilution of Precision (PDOP) when approximate methods are used to estimate the best subset of observable NAVSTAR Global Positioning System (GPS) satellites selected for position calculations. Three approximate methods are described in this Report and they are compared numerically to the best method. The *best* is defined as that subset of GPS observations that produces minimum PDOP.

Three GPS constellations are evaluated: namely, (1) the basic system of 18 satellites (BA); (2) the basic system plus 3 in-plane spares (IP); and (3) the basic system plus 3 equatorial spares (EQ). The PDOP values are calculated for satellites in circular orbits ranging from 100 to 2400 nautical miles (NM) above the earth. An observation time is input to the computer program, and the user satellite position along with the N GPS satellite positions that have line-of-sight (LOS) with the user satellite are determined. The estimated best sets of four or five GPS satellites are selected as described below, and the best sets are determined by testing all possible combinations of N GPS satellites, taking four or five at a time.

EXPERIMENT

Global Positioning Systems. The three GPS constellations have been described previously.² Essentially, the basic constellation is composed of 18 circular symmetric satellite orbits organized in 6 regularly spaced planes with 3 satellites per plane, regularly spaced in central angle. The six orbital planes are inclined 55 degrees to the equatorial plane, and the semi-major axis of each satellite is 26,561.144 km (kilometers). The three equatorial spares are spaced 120 degrees apart at 0 degree inclination. The first in-plane spare is in the first GPS orbital plane; the second in-plane spare is in the fifth GPS orbital plane; and the third in-plane spare is in the third GPS orbital plane. The arguments of latitude of the six spares are defined in a previous report.³

User Satellite Observations on GPS. Spatial positions for evaluation were determined from satellites in circular orbits where the satellite heights range from 100 NM to 2400 NM above the earth. Seven inclinations were evaluated for each satellite height; the inclinations ranged from 0 to 90 degrees in steps of 15 degrees. In order that a particular GPS satellite has LOS with any one of the orbiting user satellites, LOS as defined in a previous report must be satisfied.⁴ Essentially, the orbiting satellite must fall within the cone defined by the GPS antenna beam width, yet not be in the shadow cone defined by the earth and the GPS satellite.

¹ Crombie, M. A. Sentinel Satellite Positional Precision Derived From the NAVSTAR Global Positioning System, U.S. Army Engineer Topographic Laboratories, Fort Belvoir, Virginia 22060-5540. ETL-0544, August 1980, AD-A311 876.

² Ibid.

³ Ibid.

⁴ Ibid.

Position Dilution of Precision (PDOP). PDOP is a measure of the geometrical strength of the least squares adjustment for the three spatial coordinates of the user satellite position. Specifically, PDOP is the square root of the trace of the sample position relative covariance matrix. Since a time bias must be calculated for each position calculation, there must be at least four GPS observations for each adjustment. The results of this study pertain to four and to five GPS observations for each adjustment. The specific method for computing PDOP was given in another report.⁵ An outage was declared in this study whenever $\text{PDOP} > 6$. Outages also occur whenever an insufficient number of GPS satellites are in view, i.e. whenever there are less than four (or five) GPS satellites in view.

Approximate Methods for Selecting Best GPS Subsets. The three approximate methods for selecting the best set of four or five GPS satellites are based on results from Kihara and Okada.⁶ In that work, the authors demonstrated that the minimum Geometric Dilution of Precision (GDOP) is inversely proportional to the volume of the tetrahedron formed by the unit vectors from the user to the four best GPS satellites. The GDOP is the square root of the trace of the 4 by 4 covariance matrix for position and for the range equivalent of user clock offset with respect to GPS system time. The authors also showed that the ideal set of five GPS observations for minimum GDOP are such that the angle between any pair of unit vectors is 109.47 degrees. This last result is the basis for the approximate methods evaluated in this study.

The first step in the three approximate methods is to select that GPS satellite nearest the zenith of the user satellite. The next step is to select from the (N-1) remaining observable GPS satellites the four that most nearly make an angle of 109.47 degrees with the first GPS satellite. Four methods for determining the best user set are described next.

The first method is an exhaustive one where all possible $C_{N,4}$ or $C_{N,5}$ sets of GPS satellites are tested for minimum PDOP. The results associated with this method are referred to as EST1 in the section on numerical results. Results from the three approximate methods are compared to these results.

The next method is the most compute intensive of the approximate methods and is referred to as EST2 in the section on numerical results. If four GPS satellites are processed, then the first one is the one nearest the user satellite's zenith. The second GPS satellite is that one of four that most nearly makes an angle of 109.47 degrees with the first GPS satellite. All possible $C_{N-2,2}$ sets of the remaining (N-2) GPS satellites are then tested to determine which one produces minimum PDOP. When five GPS satellites are processed, the procedure is the same except that the second and third GPS satellites are those that most nearly make an angle of 109.47 degrees with the first GPS satellite. All possible $C_{N-3,2}$ sets of the remaining (N-3) GPS are then tested for minimum PDOP.

The method referred to as EST3 in the section on numerical results is the second most compute intensive of the approximate methods. Again, if four GPS satellites are processed, then the first one is the one nearest the user satellite's zenith. Consider the three GPS satellites that most nearly make an angle of 109.47 degrees with the first GPS satellite. Select as the second and third members of the set the pair that have the largest angular separation. The remaining (N-3) GPS satellites are then tested for minimum PDOP. When five GPS satellites are processed, combine the three GPS

⁵ Crombie, M. A. Sentinel Satellite Positional Precision Derived From the NAVSTAR Global Positioning System, U.S. Army Engineer Topographic Laboratories, Fort Belvoir, Virginia 22060-5640. ETL-0544, August 1980, AD-A211 876.

⁶ Kihara, M. and T. Okada. "A Satellite Selection Method and Accuracy for the Global Positioning System," Journal of the Institute of Navigation, Vol. 31, No. 1, Spring 1984, pp 8-20.

satellites that most nearly make an angle of 109.47 degrees with the first GPS satellite, and test the remaining (N-4) GPS satellites for minimum PDOP.

The method referred to as EST4 in the section on numerical results is the least compute intensive of the three approximate methods. If four GPS satellites are used then combine the first GPS satellite with the three GPS satellites that most nearly make an angle of 109.47 degrees with the first GPS satellite. If five GPS satellites are used then combine the first GPS satellite with the four GPS satellites that most nearly make an angle of 109.47 degrees with the first satellite.

NUMERICAL RESULTS

The three approximate methods were evaluated at 5,950 spatial positions collected from 17 orbital heights and from 7 inclinations at each orbital height. Fifty exposure times, at 10-minute intervals, were input to the computer program for each of the $7 \times 17 = 119$ circular orbits in order to generate the 5,950 spatial positions. The tests were then conducted for the three GPS constellations described above. Thus, 17,850 ($3 \times 5,950$) tests were conducted when four GPS observations were processed, and an identical number of tests were conducted when five GPS observations were processed.

The results for four GPS observations are summarized in tables A1 through A17; the results for five GPS observations are summarized in tables B1 through B17. The results are organized by satellite height and by orbital inclination within satellite height. Average PDOP values and associated standard deviation of PDOP values are presented for each of the four estimation methods, i.e. the best method, EST1, and the three approximate methods, EST2, EST3, and EST4. In addition, the average difference and the maximum difference between the approximate methods and the best methods are presented in the tables.

DISCUSSION

Three approximate methods for estimating the best subset out of N observable GPS satellites to be used in calculating precise positions in space are described and evaluated. The best subsets of four or five GPS satellites out of N observable GPS satellites are by definition those subsets that minimize PDOP. In all but four cases tested, EST1>EST2>EST3>EST4 (Read ">" to be "superior to"). The exceptions occurred when the basic GPS set of 18 satellites (BA) was tested using four observations and when the user satellite was 100 NM and 200 NM above the earth at 0 degrees and at 15 degrees inclination. In those four cases EST3>EST2. The differences are negligible and are well below the standard deviations associated with the PDOP estimates (See tables A1 and A2).

The adverse effect of estimating the best subset of observable GPS satellites for position calculation can be seen by examining the tables in appendices A and B. The effect can be realized also by noting the increase in the confidence sphere radius associated with the position estimate. From the author's report⁷ the 99 percent confidence sphere radius associated with the position estimate can be calculated from the following formula:

⁷ Crombie, M.A. Sentinel Satellite Positional Precision Derived from the NAVSTAR Global Positioning System, U.S. Army Engineer Topographic Laboratories, Fort Belvoir, Virginia 22060-5540, ETL-0344, August 1989, AD 211 876.

$$SP(99\%) = PDOP * 3.367 * SIGR/\sqrt{3}$$

PDOP = EST1 Estimate of PDOP

SIGR = Slant Range Measuring Error

Any other estimate of PDOP will be larger, and the corresponding 99 percent confidence sphere radius will be

$$SP(99\%) + \Delta SP = (PDOP + \Delta p) * 3.367 * SIGR/\sqrt{3}$$

ΔSP = Increase for Radius of Confidence Sphere

Δp = Increase In PDOP Value

A combination of the two formulas shows that

$$\Delta SP/SP(99\%) = \Delta p/PDOP$$

Then, the percentage increase in confidence sphere radius is $100 * \Delta p/PDOP$. Note that the percentage increase pertains to all confidence spheres, not just to the 99 percent.

The average percentage increase in confidence sphere radius associated with EST3 is generally over twice that of EST2, especially for the higher elevations. For example, from Table A5, the percentage increase for EST2, where the user satellite is 500 NM above the earth and in a 30-degree inclined orbit, is $2.1 (100 * 0.034/1.626)$ percent; whereas, the percentage increase for EST3 is $5.0 (100 * 0.082/1.626)$ percent. Note that the average percentage increases for EST4 under the same circumstances is $37.5 (100 * 0.061/1.626)$ percent. The EST4 estimate did not perform well under any circumstance. In fact, there were a large number of outages associated with EST4, especially when four GPS observations from the 18 basic + 3 In-plane (IP) constellation were tested. The percentage of outages ranged from 34 percent at 100 NM to 8 percent at 1600 NM. In all cases the outage was caused by PDOP exceeding the value of 6. In no instance were there less than five GPS satellites in view for any of the constellations at any time.

It was no surprise that the performance associated with five GPS observations was superior to that of four GPS observations. For example, consider the same situation described in the previous paragraph. From Tables A5 and B5, the increase in confidence sphere radius for the four estimating procedures is as follows:

EST1 = 14.5 percent
EST2 = 14.7 percent
EST3 = 13.9 percent
EST4 = 36.1 percent

In this example the PDOP associated with five GPS observations ($PDOP = 1.420$) is used as a basis for comparison.

It would appear that five GPS observations should be processed whenever possible. The PDOP results are better than when four GPS observations are processed and fewer test PDOP values must be calculated when EST2 or EST3 estimations are used. This is true since $C_{N-3,2} < C_{N-2,3}$ and $C_{N-4,1} < C_{N-3,1}$ for all $N \geq 5$. The computational load is not inconsequential for either estimator, nor inconsequential for four or five GPS observations. This statement can be appreciated by reviewing

table 1 where the average number of GPS satellites that have LOS with a user satellite at any given time is presented.

Table 1. Average Number of GPS Observations

Orbital Heights (Nautical Miles)	BA	IP	EQ	Orbital Heights (Nautical Miles)	BA	IP	EQ
100	9.0	10.4	10.4	1000	12.7	14.8	14.8
200	9.9	11.5	11.5	1200	13.2	15.4	15.3
300	10.4	12.1	12.1	1400	13.5	15.8	15.7
400	10.9	12.3	12.6	1600	13.9	16.2	16.1
500	11.3	13.2	13.2	1800	14.1	16.4	16.4
600	11.6	13.5	13.5	2000	11.7	13.7	13.6
700	12.0	14.0	14.0	2200	9.5	11.1	10.9
800	12.2	14.2	14.2	2400	8.2	9.6	9.3
900	12.5	14.6	14.6				

Processing four or five GPS observations simultaneously for position, which is necessary in a highly dynamic environment, will require a GPS receiver with four or five channels. This requirement can be removed if a receiver with two or more channels is used to update the slowly changing user satellite orbital parameters. A single channel receiver can be used if two or more GPS observations are close enough in time so that the range equivalent of user clock offset, with respect to GPS system time, can be regarded as constant.

CONCLUSIONS

1. The third approximate method for calculating PDOP, namely EST4 produced poor results, especially at the lower orbital heights.
2. There was an appreciable improvement in PDOP when five GPS observations were processed rather than four GPS observations.

REFERENCES

1. Crombie, M. A., *Sentinel Satellite Positional Precision Derived from NAVSTAR Global Positioning System*, U.S. Army Engineer Topographic Laboratories, Fort Belvoir, Virginia 22060-5546. ETL-0544, August 1989, AD 211 876.
2. Crombie, M. A., *Ground Target Location Errors Derived from Measurements Collected from a Variety of Hypothetical Satellite Sentinel Systems*, U.S. Army Engineer Topographic Laboratories, Fort Belvoir, Virginia 22060-5546. ETL-0538, June 1989, AD-209 523.
3. Kihara, M. and T. Okada, "A Satellite Selection Method and Accuracy for the Global Positioning System," *Journal of the Institute of Navigation*, Vol. 31, No. 1, Spring 1984, pp 8-20.

APPENDIX A. PDOP RESULTS FOR FOUR GPS OBSERVATIONS

TABLE A1 (H=100 NAUTICAL MILES, L=4 GPS OBSERVATIONS)

I = 0 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.911	1.843	1.858	.111	.115	.124						
2	1.999	1.920	1.925	.138	.136	.148	.088	.077	.067	.285	.280	.283
3	1.977	1.943	1.970	.147	.203	.182	.065	.100	.113	.327	.904	.420
4	2.406	2.963	2.512	.701	1.153	.852	.558	1.154	.695	3.226	3.911	3.165

I = 15 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.915	1.871	1.860	.147	.146	.135						
2	2.002	1.978	1.929	.216	.220	.188	.087	.107	.069	.569	.555	.308
3	1.982	2.019	1.977	.201	.281	.224	.068	.148	.117	.461	.928	.537
4	2.641	2.903	2.526	.869	1.143	.765	.784	1.063	.721	3.497	4.182	3.497

I = 30 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.854	1.825	1.822	.164	.161	.154						
2	1.935	1.924	1.899	.206	.212	.173	.081	.099	.077	.581	.541	.328
3	1.965	1.972	1.966	.220	.259	.216	.111	.147	.144	.475	.767	.521
4	2.726	3.098	2.868	.903	1.181	.920	.903	1.303	1.057	3.587	3.831	3.587

I = 45 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.807	1.780	1.778	.148	.139	.140						
2	1.881	1.854	1.842	.184	.180	.166	.075	.074	.064	.474	.454	.281
3	1.882	1.899	1.882	.173	.264	.184	.076	.119	.103	.474	.715	.435
4	2.475	2.677	2.769	.748	.817	.950	.692	.917	1.016	3.038	2.890	3.398

I = 60 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.797	1.772	1.768	.112	.118	.107						
2	1.849	1.824	1.825	.120	.124	.128	.051	.052	.056	.227	.211	.230
3	1.872	1.936	1.883	.150	.255	.160	.079	.165	.115	.353	1.044	.452
4	2.710	2.798	3.015	1.038	1.087	1.171	.920	1.034	1.267	4.005	4.250	4.076

I = 75 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.853	1.830	1.804	.113	.116	.090						
2	1.896	1.891	1.855	.124	.172	.125	.043	.061	.051	.259	.754	.259
3	1.953	1.989	1.924	.170	.247	.195	.100	.159	.120	.471	.913	.877
4	3.051	2.980	3.033	1.102	.933	.974	1.198	1.167	1.236	3.920	3.258	3.920

I = 90 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.905	1.875	1.842	.165	.170	.107						
2	1.957	1.948	1.901	.194	.232	.142	.052	.072	.060	.458	.686	.205
3	2.027	2.004	1.991	.231	.260	.221	.122	.128	.149	.525	.746	.688
4	3.199	3.363	3.167	1.078	1.155	.983	1.299	1.494	1.330	3.642	3.780	4.139

APPENDIX A. (continued)

TABLE A2 (H=200 NAUTICAL MILES, L=4 GPS OBSERVATIONS)

I = 0 DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.804	1.773	1.753	.152	.143	.131						
2	1.897	1.853	1.833	.185	.182	.169	.093	.081	.080	.392	.397	.279
3	1.879	1.887	1.914	.180	.199	.210	.075	.114	.161	.392	.659	.564
4	2.201	2.482	2.592	.478	.794	.866	.445	.758	.850	3.118	3.084	3.048

I = 15 DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.757	1.741	1.722	.151	.142	.117						
2	1.816	1.807	1.786	.163	.157	.157	.059	.066	.064	.280	.280	.364
3	1.813	1.831	1.847	.180	.184	.201	.056	.090	.125	.421	.443	.603
4	2.295	2.651	2.435	.804	1.094	.739	.584	.951	.723	3.214	4.164	3.115

I = 30 DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.724	1.709	1.699	.108	.103	.085						
2	1.785	1.779	1.750	.120	.122	.101	.061	.070	.051	.361	.313	.271
3	1.832	1.858	1.831	.172	.189	.154	.107	.149	.133	.457	.621	.430
4	2.636	2.760	2.714	.801	.990	.839	.920	1.052	1.022	3.239	4.052	3.496

I = 45 DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.700	1.681	1.682	.089	.090	.082						
2	1.743	1.728	1.732	.115	.119	.113	.044	.047	.050	.212	.234	.228
3	1.771	1.798	1.839	.130	.189	.242	.071	.117	.157	.249	.579	1.330
4	2.411	2.659	2.683	.752	.911	.871	.717	.979	1.015	3.274	3.227	3.257

I = 60 DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.707	1.679	1.675	.097	.093	.067						
2	1.754	1.729	1.730	.115	.110	.112	.047	.050	.055	.196	.196	.350
3	1.801	1.832	1.802	.152	.235	.152	.094	.153	.126	.387	1.018	.457
4	2.668	2.954	2.831	.844	1.079	1.045	.965	1.274	1.157	3.293	3.939	3.989

I = 75 DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ									
1	1.752	1.722	1.713	.113	.095	.082						
2	1.808	1.785	1.771	.128	.124	.136	.056	.063	.058	.297	.297	.436
3	1.912	1.899	1.836	.235	.247	.173	.161	.177	.123	.528	.913	.568
4	3.047	3.103	3.125	1.245	1.320	1.141	1.294	1.378	1.412	4.148	4.148	4.029

I = 90 DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.786	1.739	1.715	.156	.091	.075						
2	1.851	1.801	1.778	.183	.129	.126	.064	.062	.064	.387	.299	.321
3	1.952	1.866	1.835	.257	.193	.156	.163	.127	.120	.517	.480	.463
4	3.024	3.228	2.904	1.130	1.293	.777	1.246	1.491	1.198	4.116	4.141	4.142

APPENDIX A. (continued)

TABLE A3 (H=300 NAUTICAL MILES, L=4 GPS OBSERVATIONS)

I = 0 DEGREES

EST	PDOP				SIGP				AVDF				MAXD				
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	
1	1.697	1.677	1.677	.111	.096	.104											
2	1.746	1.736	1.726	.139	.126	.130	.048	.059	.050	.207	.216	.207					
3	1.803	1.822	1.814	.122	.154	.159	.106	.145	.137	.275	.681	.311					
4	2.189	2.488	2.407	.234	.903	.853	.492	.825	.741	.887	4.368	4.314					

I = 15 DEGREES

EST	PDOP				SIGP				AVDF				MAXD				
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	
1	1.687	1.666	1.670	.080	.071	.078											
2	1.729	1.710	1.730	.119	.109	.103	.042	.043	.060	.258	.280	.337					
3	1.775	1.784	1.793	.152	.171	.150	.088	.117	.123	.407	.710	.439					
4	2.261	2.594	2.603	.783	1.074	1.020	.570	.930	.937	3.334	4.212	4.266					

I = 30 DEGREES

EST	PDOP				SIGP				AVDF				MAXD				
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	
1	1.660	1.637	1.644	.064	.060	.056											
2	1.726	1.707	1.721	.102	.101	.096	.067	.070	.076	.333	.328	.353					
3	1.762	1.776	1.780	.120	.143	.134	.103	.139	.136	.333	.469	.444					
4	2.429	2.461	2.645	.792	.882	.941	.770	.827	1.007	3.426	4.304	4.232					

I = 45 DEGREES

EST	PDOP				SIGP				AVDF				MAXD				
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	
1	1.643	1.624	1.630	.080	.075	.069											
2	1.683	1.669	1.679	.107	.091	.093	.039	.045	.049	.245	.282	.245					
3	1.724	1.713	1.751	.109	.116	.126	.081	.089	.122	.275	.282	.448					
4	2.460	2.713	2.669	.787	1.044	.958	.819	1.092	1.049	3.396	4.150	4.216					

I = 60 DEGREES

EST	PDOP				SIGP				AVDF				MAXD				
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	
1	1.670	1.644	1.653	.080	.079	.073											
2	1.718	1.687	1.695	.106	.097	.097	.047	.043	.043	.247	.223	.247					
3	1.779	1.764	1.760	.165	.214	.142	.108	.120	.108	.420	1.073	.451					
4	2.534	2.822	2.991	.685	.923	1.009	.873	1.180	1.348	2.835	3.901	4.222					

I = 75 DEGREES

EST	PDOP				SIGP				AVDF				MAXD				
	BA	IP	EQ	BA	IP	EQ	BA										
1	1.730	1.695	1.681	.116	.099	.070											
2	1.773	1.731	1.722	.123	.102	.081	.043	.036	.042	.190	.171	.190					
3	1.826	1.831	1.769	.177	.246	.118	.096	.135	.089	.454	1.015	.421					
4	2.816	3.091	3.107	1.122	1.177	1.056	1.080	1.400	1.431	4.294	4.064	4.352					

I = 90 DEGREES

EST	PDOP				SIGP				AVDF				MAXD				
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	
1	1.753	1.705	1.699	.103	.087	.069											
2	1.798	1.752	1.738	.144	.109	.088	.045	.047	.038	.390	.290	.196					
3	1.892	1.856	1.819	.199	.187	.133	.138	.151	.119	.426	.561	.454					
4	2.985	3.187	2.932	1.045	1.229	1.036	1.226	1.483	1.254	4.013	4.294						

APPENDIX A. (continued)

TABLE A4 (H=400 NAUTICAL MILES, L=4 GPS OBSERVATIONS)

$I = 0$ DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.691	1.671	1.667	.123	.093	.115						
2	1.761	1.751	1.740	.171	.165	.141	.070	.079	.074	.402	.402	.230
3	1.780	1.798	1.789	.148	.168	.175	.089	.127	.123	.402	.661	.451
4	2.088	2.363	2.472	.205	.780	.674	.427	.701	.812	.939	3.862	2.832

$I = 15$ DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.663	1.649	1.641	.082	.081	.059						
2	1.728	1.718	1.703	.127	.129	.100	.066	.069	.062	.456	.348	.456
3	1.746	1.765	1.724	.129	.149	.118	.083	.116	.082	.456	.517	.523
4	2.142	2.496	2.280	.574	.938	.620	.488	.856	.638	3.163	3.921	2.832

$I = 30$ DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.641	1.625	1.627	.059	.060	.048						
2	1.708	1.700	1.688	.116	.119	.090	.067	.075	.061	.323	.344	.273
3	1.731	1.767	1.720	.125	.149	.111	.090	.142	.093	.323	.633	.343
4	2.326	2.668	2.351	.552	1.107	.682	.685	1.044	.728	2.081	4.074	2.832

$I = 45$ DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.629	1.612	1.617	.073	.073	.061						
2	1.679	1.673	1.664	.127	.125	.105	.050	.061	.048	.319	.341	.234
3	1.720	1.728	1.688	.118	.145	.109	.092	.115	.071	.319	.596	.223
4	2.479	2.809	2.677	.895	1.066	1.043	.853	1.210	1.063	4.084	4.084	4.084

$I = 60$ DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.636	1.610	1.617	.093	.081	.075						
2	1.695	1.666	1.664	.142	.132	.111	.058	.056	.047	.318	.340	.234
3	1.759	1.722	1.728	.164	.134	.143	.123	.112	.110	.393	.380	.376
4	2.544	2.657	2.888	.790	.679	1.014	.910	1.054	1.270	4.192	3.856	4.192

$I = 75$ DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.686	1.650	1.649	.097	.091	.074						
2	1.753	1.714	1.700	.130	.133	.105	.068	.064	.051	.318	.341	.235
3	1.814	1.821	1.742	.182	.258	.130	.129	.171	.093	.505	.923	.360
4	2.611	2.695	2.801	1.013	1.042	.908	.931	1.067	1.166	4.143	4.041	3.186

$I = 90$ DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ									
1	1.711	1.672	1.664	.082	.072	.074						
2	1.762	1.734	1.707	.112	.116	.100	.051	.062	.043	.294	.318	.235
3	1.840	1.801	1.775	.167	.177	.143	.129	.129	.111	.494	.543	.554
4	2.790	3.004	3.196	1.056	1.101	1.021	1.081	1.343	1.547	4.222	3.302	3.984

y

APPENDIX A. (continued)

TABLE A5 (H=500 NAUTICAL MILES, L=4 GPS OBSERVATIONS)

I = 0 DEGREES

EST	PDOP				SIGP				AVDF				MAXD				
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	
1	1.638	1.623	1.624	.049	.045	.052											
2	1.698	1.676	1.679	.118	.100	.103	.060	.053	.054	.350	.350	.350					
3	1.739	1.742	1.777	.106	.137	.143	.100	.119	.153	.465	.608	.466					
4	2.080	2.287	2.368	.231	.822	.780	.442	.668	.749	.966	3.868	3.752					

I = 15 DEGREES

EST	PDOP				SIGP				AVDF				MAXD				
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	
1	1.638	1.619	1.625	.058	.057	.055											
2	1.672	1.652	1.669	.069	.064	.069	.034	.032	.044	.176	.181	.231					
3	1.714	1.707	1.748	.089	.101	.114	.075	.088	.123	.281	.300	.432					
4	2.174	2.272	2.263	.643	.626	.611	.535	.656	.643	4.078	3.065	2.642					

I = 30 DEGREES

EST	PDOP				SIGP				AVDF				MAXD				
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	
1	1.626	1.607	1.614	.063	.060	.056											
2	1.660	1.644	1.665	.093	.083	.099	.034	.037	.051	.228	.191	.228					
3	1.708	1.702	1.727	.083	.086	.084	.082	.095	.113	.266	.266	.272					
4	2.233	2.412	2.506	.594	.837	.910	.610	.809	.898	3.125	3.694	2.951					

I = 45 DEGREES

EST	PDOP				SIGP				AVDF				MAXD				
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	
1	1.605	1.586	1.595	.067	.062	.061											
2	1.644	1.640	1.641	.094	.089	.091	.038	.054	.046	.213	.216	.197					
3	1.695	1.695	1.693	.100	.117	.103	.089	.109	.098	.279	.338	.308					
4	2.393	2.408	2.555	.787	.644	.908	.790	.830	.971	3.157	3.096	3.218					

I = 60 DEGREES

EST	PDOP				SIGP				AVDF				MAXD				
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	
1	1.616	1.594	1.598	.079	.064	.054											
2	1.651	1.637	1.649	.102	.082	.090	.035	.043	.051	.201	.183	.241					
3	1.726	1.718	1.739	.122	.141	.100	.110	.124	.141	.434	.801	.434					
4	2.500	2.708	2.709	.796	1.040	1.057	.891	1.201	1.111	3.418	3.817	3.603					

I = 75 DEGREES

EST	PDOP				SIGP				AVDF				MAXD				
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	
1	1.651	1.617	1.623	.083	.071	.062											
2	1.704	1.679	1.675	.113	.091	.089	.053	.062	.052	.353	.220	.214					
3	1.773	1.770	1.731	.126	.167	.089	.122	.153	.108	.328	.753	.266					
4	2.358	2.626	2.699	.725	.949	.996	.721	1.022	1.079	2.459	3.586	3.168					

I = 90 DEGREES

EST	PDOP				SIGP				AVDF				MAXD				
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	
1	1.688	1.648	1.643	.099	.083	.079											
2	1.746	1.725	1.695	.142	.111	.109	.058	.077	.052	.294	.220	.243					
3	1.817	1.784	1.755	.156	.193	.104	.129	.136	.112	.429	.836	.398					
4	2.608	2.955	2.697	1.001	1.261	1.008	.923	1.322	1.064	4.111	4.173	4.007					

APPENDIX A. (continued)

TABLE A6 (H=600 NAUTICAL MILES, L=4 GPS OBSERVATIONS)

I = 0 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.622	1.607	1.609	.032	.027	.038						
2	1.661	1.649	1.648	.077	.078	.067	.039	.042	.040	.338	.338	.232
3	1.717	1.706	1.738	.087	.127	.113	.095	.099	.130	.402	.586	.410
4	2.052	2.210	2.408	.236	.715	.848	.430	.600	.801	1.014	3.891	3.521

I = 15 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.624	1.610	1.612	.053	.052	.052						
2	1.660	1.651	1.656	.092	.082	.078	.036	.041	.043	.295	.295	.222
3	1.715	1.688	1.722	.092	.108	.121	.091	.079	.110	.417	.574	.426
4	2.086	2.360	2.304	.479	.902	.778	.460	.751	.696	3.113	4.290	3.113

I = 30 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.599	1.583	1.590	.055	.049	.053						
2	1.642	1.635	1.642	.093	.087	.085	.043	.052	.052	.224	.212	.210
3	1.703	1.676	1.716	.087	.082	.141	.103	.093	.126	.286	.273	.715
4	2.135	2.270	2.389	.406	.815	.853	.540	.688	.804	2.157	3.948	3.098

I = 45 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.596	1.574	1.584	.064	.056	.055						
2	1.625	1.612	1.622	.077	.073	.067	.029	.038	.039	.178	.178	.204
3	1.678	1.674	1.682	.093	.120	.124	.082	.100	.098	.255	.426	.737
4	2.277	2.426	2.423	.572	.920	.805	.684	.857	.843	2.524	4.271	3.083

I = 60 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.601	1.581	1.589	.063	.059	.050						
2	1.662	1.637	1.638	.099	.089	.072	.061	.055	.049	.319	.319	.190
3	1.707	1.731	1.716	.094	.161	.109	.106	.150	.127	.268	.796	.458
4	2.457	2.600	2.773	.773	.965	1.027	.856	1.019	1.184	2.993	4.303	3.204

I = 75 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.622	1.596	1.602	.066	.056	.046						
2	1.661	1.652	1.636	.081	.073	.061	.038	.056	.034	.195	.195	.160
3	1.747	1.730	1.711	.132	.121	.084	.125	.134	.110	.484	.484	.249
4	2.381	2.493	2.694	.920	1.000	1.034	.769	.902	1.094	4.255	4.163	4.279

I = 90 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.664	1.633	1.629	.090	.088	.067						
2	1.716	1.682	1.669	.124	.102	.078	.052	.050	.039	.324	.217	.179
3	1.814	1.783	1.733	.160	.162	.109	.150	.150	.103	.468	.619	.399
4	2.409	2.401	2.683	.746	.733	.832	.756	.778	1.069	2.729	2.884	3.047

APPENDIX A. (continued)

TABLE A7 (H=700 NAUTICAL MILES, L=4 GPS OBSERVATIONS)

I = 0 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.611	1.600	1.598	.035	.037	.041						
2	1.646	1.631	1.631	.064	.062	.060	.035	.031	.034	.297	.297	.206
3	1.711	1.708	1.718	.088	.094	.103	.100	.108	.120	.411	.411	.404
4	1.984	2.125	2.246	.252	.532	.624	.373	.523	.648	.991	3.068	3.137

I = 15 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.608	1.590	1.595	.049	.039	.040						
2	1.642	1.628	1.634	.075	.071	.071	.034	.038	.0394	.306	.289	.306
3	1.707	1.700	1.714	.094	.090	.125	.099	.110	.119	.401	.334	.582
4	2.028	2.372	2.178	.318	.859	.581	.419	.781	.582	1.443	3.848	2.560

I = 30 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.587	1.573	1.580	.051	.047	.047						
2	1.617	1.607	1.616	.068	.064	.074	.030	.034	.036	.191	.191	.191
3	1.695	1.667	1.688	.089	.092	.104	.107	.096	.108	.267	.253	.443
4	2.115	2.391	2.218	.443	.788	.593	.528	.818	.641	1.867	3.789	2.323

I = 45 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.585	1.566	1.578	.054	.051	.050						
2	1.611	1.600	1.604	.079	.070	.071	.026	.033	.027	.181	.213	.154
3	1.695	1.664	1.697	.087	.094	.124	.110	.098	.119	.267	.267	.696
4	2.126	2.363	2.336	.475	.911	.804	.545	.797	.768	2.059	3.986	3.515

I = 60 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.587	1.569	1.577	.055	.047	.044						
2	1.636	1.613	1.628	.084	.078	.072	.049	.044	.051	.192	.192	.186
3	1.699	1.676	1.683	.089	.076	.087	.112	.107	.106	.278	.230	.229
4	2.255	2.468	2.600	.696	.945	.998	.668	.921	1.024	2.868	4.214	4.063

I = 75 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.611	1.590	1.598	.064	.060	.053						
2	1.655	1.635	1.639	.098	.077	.072	.044	.045	.042	.253	.183	.228
3	1.732	1.718	1.695	.126	.153	.082	.121	.128	.097	.478	.986	.268
4	2.393	2.312	2.828	.931	.647	1.132	.791	.732	1.231	4.421	2.512	4.421

I = 90 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.645	1.611	1.611	.077	.064	.061						
2	1.697	1.671	1.662	.091	.087	.098	.051	.060	.051	.210	.203	.268
3	1.793	1.741	1.719	.147	.131	.107	.148	.130	.108	.457	.551	.355
4	2.387	2.309	2.560	.874	.775	.894	.749	.701	.963	3.821	4.002	2.906

APPENDIX A. (continued)

TABLE A8 (H=800 NAUTICAL MILES, L=4 GPS OBSERVATIONS)

I = 0 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.603	1.593	1.590	.036	.032	.037						
2	1.638	1.629	1.643	.057	.051	.068	.035	.036	.053	.188	.181	.258
3	1.706	1.704	1.733	.076	.096	.084	.103	.112	.143	.247	.392	.381
4	1.985	2.155	2.132	.221	.702	.467	.382	.561	.543	.787	3.621	2.338

I = 15 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.595	1.581	1.585	.045	.038	.041						
2	1.633	1.620	1.622	.077	.063	.060	.038	.039	.037	.285	.217	.171
3	1.701	1.693	1.711	.083	.086	.090	.106	.113	.126	.285	.333	.333
4	2.095	2.167	2.320	.602	.851	.871	.500	.584	.732	3.264	3.450	3.363

I = 30 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.578	1.565	1.571	.049	.045	.041						
2	1.611	1.597	1.609	.068	.066	.066	.033	.031	.038	.198	.198	.200
3	1.672	1.671	1.673	.074	.083	.074	.094	.106	.102	.207	.305	.205
4	2.011	2.197	2.333	.363	.735	.656	.434	.634	.761	1.291	4.205	2.971

I = 45 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.583	1.563	1.569	.056	.051	.046						
2	1.605	1.590	1.603	.073	.072	.072	.022	.026	.034	.157	.193	.184
3	1.684	1.668	1.668	.101	.098	.092	.101	.104	.099	.294	.309	.237
4	2.060	2.190	2.502	.496	.536	.928	.478	.627	.934	2.545	2.233	3.838

I = 60 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.582	1.563	1.572	.051	.047	.042						
2	1.623	1.600	1.617	.069	.067	.066	.041	.037	.045	.179	.189	.170
3	1.697	1.675	1.689	.093	.084	.091	.115	.111	.117	.308	.282	.308
4	2.130	2.364	2.483	.535	.608	.810	.540	.801	.910	2.637	2.590	3.264

I = 75 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.601	1.581	1.587	.066	.052	.050						
2	1.645	1.623	1.632	.096	.078	.081	.044	.042	.045	.282	.216	.282
3	1.732	1.708	1.696	.167	.128	.091	.131	.127	.107	.452	.480	.294
4	2.282	2.528	2.715	.679	.893	.850	.688	.954	1.125	2.703	3.533	3.071

I = 90 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.641	1.604	1.610	.090	.067	.065						
2	1.705	1.662	1.648	.148	.111	.102	.064	.058	.038	.421	.377	.377
3	1.773	1.752	1.722	.150	.153	.122	.133	.148	.112	.449	.563	.381
4	2.216	2.432	2.521	.651	.912	.765	.585	.826	.911	2.476	3.641	2.281

APPENDIX A. (continued)

TABLE A9 (H=900 NAUTICAL MILES, L=4 GPS OBSERVATIONS)

I = 0 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.602	1.586	1.586	.041	.035	.034						
2	1.613	1.604	1.616	.037	.034	.031	.011	.018	.030	.100	.100	.099
3	1.679	1.674	1.695	.068	.075	.070	.077	.088	.108	.244	.215	.216
4	1.914	2.004	2.204	.247	.374	.522	.312	.416	.618	.827	1.722	1.841

I = 15 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.589	1.576	1.578	.045	.037	.036						
2	1.616	1.601	1.613	.053	.043	.045	.027	.025	.035	.190	.119	.125
3	1.681	1.691	1.705	.070	.079	.081	.091	.115	.127	.213	.298	.301
4	1.953	2.042	2.238	.286	.387	.534	.364	.466	.659	.893	1.585	1.849

I = 30 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.578	1.562	1.569	.054	.046	.043						
2	1.617	1.598	1.617	.054	.052	.061	.039	.037	.049	.134	.135	.206
3	1.683	1.676	1.679	.070	.088	.076	.105	.115	.111	.196	.338	.195
4	1.943	2.108	2.194	.287	.567	.449	.362	.546	.621	1.217	2.630	1.299

I = 45 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.580	1.558	1.569	.061	.051	.052						
2	1.609	1.585	1.608	.067	.059	.074	.029	.027	.038	.182	.176	.208
3	1.672	1.676	1.685	.081	.097	.078	.092	.119	.115	.235	.417	.235
4	2.109	2.445	2.305	.689	.890	.623	.531	.904	.737	2.540	3.218	2.542

I = 60 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.579	1.557	1.566	.058	.047	.048						
2	1.590	1.579	1.593	.066	.055	.076	.011	.022	.027	.166	.135	.223
3	1.656	1.667	1.674	.096	.083	.091	.077	.110	.108	.282	.286	.282
4	2.268	2.614	2.216	.778	.978	.593	.690	1.057	.651	2.620	3.916	2.228

I = 75 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.591	1.571	1.576	.064	.053	.050						
2	1.625	1.608	1.609	.081	.063	.069	.034	.037	.034	.191	.191	.208
3	1.716	1.709	1.674	.142	.161	.092	.125	.138	.098	.319	.935	.308
4	2.406	2.481	2.303	.950	.945	.783	.818	.910	.812	2.769	3.267	2.769

I = 90 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.602	1.582	1.582	.057	.050	.042						
2	1.642	1.621	1.627	.059	.059	.059	.041	.038	.045	.253	.197	.253
3	1.690	1.685	1.673	.089	.088	.085	.088	.103	.091	.267	.324	.217
4	2.498	2.409	2.727	1.129	1.067	1.241	.896	.821	1.145	4.100	3.935	4.167

APPENDIX A. (continued)

TABLE A10 (H=1000 NAUTICAL MILES, L=4 GPS OBSERVATIONS)

I = 0 DEGREES

EST	POOP				SIGP				AVDF				MAXD			
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA
1	1.584	1.575	1.572	.036	.033	.033							.181	.164	.181	
2	1.615	1.607	1.619	.044	.041	.045	.031	.032	.046	.150	.164	.162				
3	1.676	1.673	1.696	.077	.082	.077	.092	.098	.124	.237	.329	.318				
4	2.018	2.125	2.197	.344	.592	.458	.433	.551	.624	1.351	3.467	1.795				

I = 15 DEGREES

EST	POOP				SIGP				AVDF				MAXD			
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA
1	1.580	1.570	1.570	.037	.036	.034							.150	.164	.162	
2	1.619	1.607	1.615	.049	.042	.049	.039	.037	.046	.112	.103	.112	.281	.339	.271	
3	1.692	1.673	1.682	.084	.078	.083	.112	.103	.049	.104	.104	.104	.205	.346	.598	
4	2.015	2.060	2.169	.325	.591	.554	.435	.490	.600	1.226	3.606	2.035				

I = 30 DEGREES

EST	POOP				SIGP				AVDF				MAXD			
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA
1	1.566	1.555	1.561	.045	.040	.041							.143	.163	.143	
2	1.614	1.597	1.610	.049	.050	.053	.048	.042	.049	.112	.103	.112	.259	.426	.259	
3	1.662	1.670	1.665	.084	.085	.109	.097	.115	.104	.104	.104	.104	.205	.346	.598	
4	2.144	2.315	2.311	.570	.785	.716	.579	.760	.745	3.156	3.336	3.156				

I = 45 DEGREES

EST	POOP				SIGP				AVDF				MAXD			
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA
1	1.569	1.552	1.557	.052	.044	.046							.196	.163	.196	
2	1.601	1.590	1.587	.063	.052	.060	.033	.038	.029	.196	.163	.196				
3	1.658	1.665	1.644	.097	.098	.096	.089	.113	.087	.259	.426	.259				
4	2.207	2.481	2.202	.826	1.128	.761	.639	.926	.645	3.817	4.198	3.852				

I = 60 DEGREES

EST	POOP				SIGP				AVDF				MAXD			
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA
1	1.568	1.552	1.558	.047	.042	.040							.164	.164	.164	
2	1.603	1.586	1.597	.063	.051	.059	.035	.034	.039	.164	.164	.164				
3	1.666	1.678	1.678	.087	.144	.098	.098	.126	.120	.251	.864	.492				
4	2.327	2.651	2.398	.770	1.008	.670	.759	1.099	.840	3.048	4.165	2.797				

I = 75 DEGREES

EST	POOP				SIGP				AVDF				MAXD			
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA
1	1.588	1.572	1.568	.058	.049	.038							.212	.162	.167	
2	1.635	1.615	1.614	.082	.060	.063	.048	.043	.046	.164	.164	.164				
3	1.711	1.712	1.675	.134	.171	.090	.124	.140	.107	.509	.972	.328				
4	2.225	2.437	2.467	.801	.935	.931	.638	.865	.898	4.163	4.176	4.055				

I = 90 DEGREES

EST	POOP				SIGP				AVDF				MAXD			
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA
1	1.588	1.573	1.571	.056	.050	.040							.190	.193	.190	
2	1.631	1.623	1.609	.074	.068	.057	.043	.050	.038	.190	.193	.190				
3	1.710	1.698	1.693	.116	.093	.089	.122	.124	.112	.296	.389	.258				
4	2.235	2.226	2.662	.555	.585	.973	.652	.658	1.089	2.517	2.627	4.291				

APPENDIX A. (continued)

TABLE A11 (H=1200 NAUTICAL MILES, L=4 GPS OBSERVATIONS)

I = 0 DEGREES

EST	POOP				SIGP				AVDF				MAXD				
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	
1	1.574	1.565	1.566	.033	.031	.030											
2	1.600	1.594	1.603	.043	.040	.043	.026	.029	.037	.115	.117	.142					
3	1.663	1.643	1.673	.073	.072	.080	.089	.078	.108	.254	.264	.258					
4	1.934	2.231	2.147	.324	.907	.568	.359	.666	.582	1.315	4.129	2.981					

I = 15 DEGREES

EST	POOP				SIGP				AVDF				MAXD				
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	
1	1.568	1.560	1.561	.034	.033	.030											
2	1.599	1.595	1.602	.046	.044	.047	.031	.035	.041	.118	.118	.149					
3	1.666	1.651	1.693	.073	.073	.095	.098	.091	.132	.301	.230	.419					
4	1.935	2.255	2.083	.283	.918	.599	.367	.695	.522	1.256	4.202	2.980					

I = 30 DEGREES

EST	POOP				SIGP				AVDF				MAXD				
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	
1	1.564	1.550	1.558	.038	.035	.034											
2	1.597	1.583	1.593	.049	.043	.046	.033	.032	.035	.128	.144	.128					
3	1.664	1.652	1.677	.070	.076	.093	.099	.102	.119	.211	.247	.409					
4	2.081	2.133	2.218	.464	.577	.767	.517	.584	.660	1.681	2.525	2.976					

I = 45 DEGREES

EST	POOP				SIGP				AVDF				MAXD				
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	
1	1.561	1.546	1.554	.038	.035	.034											
2	1.590	1.571	1.581	.047	.042	.046	.029	.025	.027	.192	.129	.192					
3	1.667	1.641	1.656	.089	.088	.101	.107	.096	.103	.356	.356	.407					
4	2.168	2.482	2.523	.664	1.130	1.052	.607	.937	.968	3.225	4.311	3.743					

I = 60 DEGREES

EST	POOP				SIGP				AVDF				MAXD				
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	
1	1.561	1.548	1.553	.038	.035	.034											
2	1.588	1.579	1.579	.053	.052	.046	.027	.032	.026	.203	.171	.171					
3	1.655	1.649	1.665	.096	.085	.115	.094	.102	.112	.361	.361	.410					
4	2.257	2.302	2.619	.583	.597	.928	.698	.755	1.065	2.543	2.660	3.922					

I = 75 DEGREES

EST	POOP				SIGP				AVDF				MAXD				
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	
1	1.570	1.558	1.562	.036	.034	.032											
2	1.609	1.594	1.590	.069	.054	.053	.039	.036	.027	.216	.216	.131					
3	1.682	1.661	1.684	.093	.078	.094	.112	.103	.121	.293	.279	.314					
4	2.181	2.242	2.621	.564	.560	.976	.612	.684	1.059	2.684	2.467	3.720					

I = 90 DEGREES

EST	POOP				SIGP				AVDF				MAXD				
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	
1	1.579	1.567	1.567	.049	.038	.040											
2	1.623	1.606	1.609	.063	.047	.058	.046	.039	.042	.191	.165	.208					
3	1.694	1.686	1.693	.096	.068	.083	.115	.088	.126	.324	.225	.276					
4	2.247	2.490	3.087	.694	.850	1.346	.670	.925	1.528	3.410	3.653	4.445					

APPENDIX A. (continued)

TABLE A12 (H=1400 NAUTICAL MILES, L=4 GPS OBSERVATIONS)

$I = 0$ DEGREES

EST	PDOP				SIGP				AVDF				MAXD				
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	
1	1.564	1.557	1.558	.026	.025	.024											
2	1.594	1.590	1.593	.044	.046	.047	.030	.033	.035	.156	.156	.160					
3	1.647	1.631	1.654	.066	.069	.069	.082	.074	.096	.247	.247	.254					
4	1.942	2.246	2.135	.329	.873	.635	.378	.691	.576	1.286	3.986	3.593					

$I = 15$ DEGREES

EST	PDOP				SIGP				AVDF				MAXD				
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	
1	1.563	1.551	1.558	.027	.024	.028											
2	1.595	1.592	1.594	.044	.044	.049	.032	.042	.036	.105	.144	.132					
3	1.673	1.664	1.672	.073	.083	.087	.110	.113	.114	.328	.365	.328					
4	2.012	2.143	2.043	.347	.608	.478	.449	.593	.484	1.682	3.404	2.248					

$I = 30$ DEGREES

EST	PDOP				SIGP				AVDF				MAXD				
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	
1	1.561	1.542	1.558	.033	.027	.031											
2	1.597	1.580	1.592	.058	.055	.055	.036	.039	.035	.137	.199	.118					
3	1.668	1.660	1.675	.069	.083	.082	.107	.119	.117	.216	.377	.305					
4	2.117	2.317	2.393	.397	.873	.712	.556	.776	.834	1.887	4.435	2.606					

$I = 45$ DEGREES

EST	PDOP				SIGP				AVDF				MAXD				
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	
1	1.557	1.536	1.554	.033	.026	.031											
2	1.583	1.563	1.577	.050	.049	.047	.025	.027	.023	.138	.210	.138					
3	1.664	1.656	1.674	.068	.069	.073	.107	.120	.120	.263	.248	.263					
4	2.183	2.274	2.494	.523	.527	.635	.626	.733	.940	2.420	1.912	3.616					

$I = 60$ DEGREES

EST	PDOP				SIGP				AVDF				MAXD				
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	
1	1.556	1.539	1.552	.031	.029	.030											
2	1.578	1.569	1.573	.044	.046	.048	.022	.030	.021	.139	.132	.145					
3	1.645	1.648	1.655	.080	.079	.091	.089	.108	.103	.259	.259	.291					
4	2.506	2.436	2.736	.969	.808	.992	.947	.897	1.183	3.925	3.705	3.761					

$I = 75$ DEGREES

EST	PDOP				SIGP				AVDF				MAXD				
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	
1	1.562	1.549	1.555	.029	.028	.028											
2	1.596	1.589	1.586	.055	.052	.054	.034	.041	.031	.138	.184	.169					
3	1.677	1.683	1.682	.086	.102	.117	.115	.135	.127	.312	.585	.516					
4	2.282	2.403	2.566	.591	.849	.917	.720	.855	1.015	2.862	4.097	3.559					

$I = 90$ DEGREES

EST	PDOP				SIGP				AVDF				MAXD				
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	
1	1.571	1.560	1.560	.048	.041	.034											
2	1.613	1.600	1.593	.061	.052	.058	.042	.040	.034	.178	.178	.178					
3	1.686	1.674	1.689	.106	.100	.106	.114	.114	.130	.340	.340	.448					
4	2.346	2.495	2.636	.783	.829	.913	.779	.960	1.077	3.325	3.367	4.263					

APPENDIX A. (continued)

TABLE A13 (H=1600 NAUTICAL MILES, L=4 GPS OBSERVATIONS)

I = 0 DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.562	1.556	1.554	.023	.022	.024						
2	1.579	1.575	1.589	.032	.034	.036	.018	.020	.035	.059	.070	.104
3	1.643	1.632	1.656	.064	.062	.074	.081	.077	.102	.224	.215	.321
4	2.037	2.104	2.269	.361	.852	.629	.475	.547	.715	1.303	4.218	3.058

I = 15 DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.562	1.553	1.556	.028	.024	.027						
2	1.588	1.581	1.589	.039	.038	.037	.026	.029	.033	.100	.100	.106
3	1.651	1.636	1.663	.078	.079	.084	.088	.083	.107	.234	.247	.409
4	2.156	2.390	2.273	.640	.830	.812	.593	.839	.716	3.876	3.876	3.926

I = 30 DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.561	1.546	1.555	.034	.026	.032						
2	1.588	1.578	1.583	.049	.049	.044	.027	.032	.028	.138	.138	.108
3	1.653	1.649	1.655	.079	.077	.085	.092	.103	.100	.205	.238	.340
4	2.187	2.245	2.249	.618	.771	.782	.626	.700	.694	3.183	3.918	3.183

I = 45 DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.558	1.541	1.551	.033	.027	.031						
2	1.582	1.568	1.576	.040	.042	.038	.024	.027	.025	.119	.147	.119
3	1.656	1.649	1.650	.083	.090	.080	.098	.108	.099	.284	.326	.290
4	2.152	2.284	2.392	.573	.824	.985	.595	.743	.844	2.945	4.025	4.288

I = 60 DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.560	1.541	1.554	.033	.027	.029						
2	1.576	1.567	1.570	.049	.044	.040	.016	.026	.016	.187	.162	.150
3	1.653	1.650	1.665	.083	.114	.119	.094	.109	.111	.259	.731	.732
4	2.468	2.455	2.705	.903	.970	1.156	.907	.915	1.150	4.191	4.348	4.191

I = 75 DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.560	1.547	1.553	.027	.025	.025						
2	1.589	1.582	1.580	.048	.047	.038	.029	.035	.027	.175	.175	.134
3	1.652	1.650	1.665	.087	.085	.094	.092	.103	.112	.272	.312	.305
4	2.120	2.247	2.845	.589	.691	1.174	.560	.701	1.293	2.720	4.088	4.427

I = 90 DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ									
1	1.567	1.554	1.555	.043	.031	.026						
2	1.595	1.589	1.581	.060	.057	.049	.027	.034	.027	.153	.153	.168
3	1.653	1.642	1.680	.097	.082	.116	.086	.088	.125	.298	.221	.425
4	2.580	2.700	3.020	1.165	1.129	1.394	1.012	1.146	1.465	4.123	4.192	4.287

APPENDIX A. (continued)

TABLE A14 (H=1800 NAUTICAL MILES, L=4 GPS OBSERVATIONS)

I = 0 DEGREES

EST	POOP				SIGP				AVDF				MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	B/	IP	EQ
1	1.560	1.552	1.557	.020	.020	.022									
2	1.585	1.579	1.586	.027	.030	.033	.025	.027	.029	.077	.088	.111			
3	1.637	1.640	1.650	.062	.070	.079	.077	.088	.093	.216	.232	.408			
4	2.258	2.379	2.088	.974	.990	.587	.697	.826	.532	3.929	3.929	2.957			

I = 15 DEGREES

EST	POOP				SIGP				AVDF				MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	B/	IP	EQ
1	1.564	1.555	1.557	.027	.023	.027									
2	1.587	1.585	1.583	.042	.040	.038	.023	.029	.027	.140	.140	.127			
3	1.631	1.663	1.648	.062	.212	.077	.067	.108	.092	.249	1.524	.336			
4	2.117	2.215	2.139	.662	.737	.519	.553	.660	.581	3.629	3.289	2.043			

I = 30 DEGREES

EST	POOP				SIGP				AVDF				MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	B/	IP	EQ
1	1.563	1.552	1.556	.034	.027	.032									
2	1.588	1.583	1.589	.042	.039	.044	.026	.031	.033	.122	.114	.130			
3	1.648	1.642	1.648	.070	.070	.071	.086	.090	.092	.200	.211	.254			
4	2.295	2.541	2.455	.874	1.060	.884	.734	.990	.900	3.751	4.066	4.325			

I = 45 DEGREES

EST	POOP				SIGP				AVDF				MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	B/	IP	EQ
1	1.557	1.545	1.553	.035	.028	.033									
2	1.589	1.579	1.581	.051	.048	.051	.031	.034	.028	.156	.136	.156			
3	1.641	1.645	1.643	.070	.089	.086	.084	.100	.090	.246	.565	.358			
4	2.385	2.564	2.571	.935	.898	1.096	.827	1.023	1.017	4.377	3.658	4.377			

I = 60 DEGREES

EST	POOP				SIGP				AVDF				MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	B/	IP	EQ
1	1.557	1.544	1.552	.033	.027	.033									
2	1.582	1.576	1.576	.046	.049	.043	.024	.032	.024	.124	.151	.108			
3	1.622	1.644	1.634	.066	.062	.090	.065	.100	.082	.236	.241	.369			
4	2.389	2.397	2.561	.808	.854	.854	.831	.852	1.030	4.380	4.380	3.494			

I = 75 DEGREES

EST	POOP				SIGP				AVDF				MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	B/	IP	EQ
1	1.556	1.543	1.548	.027	.025	.024									
2	1.578	1.560	1.573	.043	.043	.039	.023	.033	.027	.101	.122	.101			
3	1.639	1.680	1.671	.078	.065	.091	.103	.114	.123	.279	.397	.320			
4	2.410	2.351	2.379	.702	.647	.733	.653	.804	.831	4.067	3.687	3.572			

I = 90 DEGREES

EST	POOP				SIGP				AVDF				MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	B/	IP	EQ
1	1.561	1.551	1.552	.026	.023	.023									
2	1.568	1.578	1.582	.045	.042	.047	.027	.027	.030	.122	.128	.191			
3	1.652	1.642	1.671	.066	.060	.098	.091	.092	.119	.243	.243	.311			
4	2.229	2.314	2.415	.507	.529	.767	.668	.765	.866	3.626	2.626	3.316			

APPENDIX A. (continued)

TABLE A15 (H=2000 NAUTICAL MILES, L=4 GPS OBSERVATIONS)

$I = 0$ DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.577	1.567	1.575	.029	.024	.029						
2	1.635	1.623	1.616	.077	.070	.053	.059	.056	.041	.242	.215	.207
3	1.732	1.725	1.723	.155	.132	.118	.155	.158	.148	.501	.550	.445
4	2.576	2.665	2.306	.839	.901	.687	.999	1.097	.730	2.777	3.951	2.683

$I = 15$ DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.581	1.573	1.573	.031	.029	.032						
2	1.608	1.607	1.607	.063	.063	.064	.027	.034	.034	.206	.206	.206
3	1.674	1.679	1.682	.108	.203	.109	.093	.107	.110	.412	1.402	.389
4	2.277	2.364	2.209	.765	.896	.596	.696	.792	.636	4.062	4.062	2.335

$I = 30$ DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.582	1.566	1.570	.039	.036	.037						
2	1.603	1.604	1.603	.057	.064	.055	.022	.038	.033	.111	.189	.116
3	1.665	1.665	1.657	.110	.104	.109	.083	.099	.087	.389	.416	.389
4	2.150	2.330	2.493	.918	.847	1.044	.567	.765	.921	3.803	3.334	3.803

$I = 45$ DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.573	1.561	1.564	.039	.035	.038						
2	1.607	1.598	1.595	.068	.072	.052	.034	.037	.030	.264	.264	.131
3	1.688	1.697	1.674	.133	.153	.119	.115	.136	.110	.448	.721	.389
4	2.373	2.415	2.660	.800	.729	1.112	.801	.853	1.095	4.179	2.556	4.376

$I = 60$ DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.572	1.558	1.559	.036	.035	.034						
2	1.608	1.602	1.603	.062	.064	.052	.035	.044	.044	.178	.178	.206
3	1.695	1.704	1.695	.140	.149	.153	.123	.146	.136	.428	.568	.741
4	2.375	2.504	2.780	.772	.804	1.094	.803	.966	1.222	3.859	3.859	4.239

$I = 75$ DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.573	1.563	1.557	.030	.030	.023						
2	1.629	1.620	1.612	.094	.091	.080	.056	.057	.055	.441	.441	.401
3	1.687	1.717	1.666	.122	.170	.109	.115	.194	.109	.441	1.030	.480
4	2.468	2.605	2.851	.860	1.039	1.011	.895	1.042	1.296	3.695	3.979	3.695

$I = 90$ DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.588	1.576	1.562	.038	.033	.025						
2	1.633	1.626	1.619	.062	.073	.060	.045	.050	.057	.226	.356	.224
3	1.708	1.711	1.696	.125	.131	.129	.120	.136	.134	.504	.520	.525
4	2.335	2.529	2.473	.778	.870	.896	.767	.953	.912	3.070	3.072	3.680

APPENDIX A. (continued)

TABLE A16 (H=2200 NAUTICAL MILES, L=4 GPS OBSERVATIONS)

I = 0 DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.625	1.617	1.613	.062	.058	.058						
2	1.697	1.705	1.675	.127	.120	.093	.072	.089	.062	.419	.405	.405
3	1.767	1.784	1.755	.169	.166	.144	.141	.167	.142	.530	.530	.500
4	2.510	2.829	2.681	.728	1.062	.981	.884	1.209	1.073	3.178	4.225	3.605

I = 15 DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.619	1.605	1.604	.059	.047	.051						
2	1.650	1.656	1.656	.074	.077	.075	.031	.050	.052	.213	.230	.213
3	1.724	1.718	1.718	.128	.121	.120	.106	.113	.114	.426	.402	.387
4	2.218	2.393	2.528	.718	.823	.871	.598	.785	.921	3.423	3.239	3.661

I = 30 DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.617	1.599	1.595	.051	.047	.047						
2	1.671	1.675	1.659	.086	.085	.073	.054	.075	.064	.269	.274	.269
3	1.725	1.759	1.732	.127	.256	.130	.108	.159	.137	.387	1.440	.535
4	2.320	2.611	2.617	.738	1.060	1.056	.703	1.018	1.025	3.540	4.241	4.093

I = 45 DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.611	1.596	1.596	.045	.042	.042						
2	1.662	1.666	1.645	.073	.070	.065	.051	.070	.049	.266	.281	.229
3	1.774	1.768	1.770	.172	.186	.181	.163	.172	.174	.643	1.022	.681
4	2.632	2.798	2.867	.933	1.165	1.144	1.022	1.199	1.268	4.229	4.232	4.229

I = 60 DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ									
1	1.622	1.600	1.592	.104	.046	.049						
2	1.679	1.663	1.635	.155	.121	.085	.058	.063	.043	.306	.555	.293
3	1.790	1.773	1.756	.203	.151	.160	.168	.173	.164	.548	.555	.585
4	2.823	2.950	3.023	1.164	1.081	1.214	1.197	1.344	1.433	4.285	4.285	3.993

I = 75 DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ									
1	1.639	1.620	1.603	.077	.071	.065						
2	1.710	1.701	1.660	.112	.103	.092	.071	.081	.057	.290	.237	.255
3	1.798	1.793	1.763	.168	.167	.169	.160	.174	.161	.529	.536	.601
4	2.812	3.006	3.087	1.100	1.281	1.188	1.168	1.360	1.479	4.105	4.294	3.886

I = 90 DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.626	1.603	1.587	.055	.046	.044						
2	1.703	1.688	1.658	.116	.099	.091	.078	.086	.071	.385	.312	.285
3	1.780	1.777	1.740	.173	.202	.160	.154	.174	.153	.553	.648	.489
4	2.713	2.580	2.924	1.047	.940	1.189	1.090	.980	1.338	3.958	3.164	3.761

APPENDIX A. (continued)

TABLE A17 (H=2400 NAUTICAL MILES, L=4 GPS OBSERVATIONS)

$I = 0$ DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.670	1.651	1.652	.072	.065	.070						
2	1.740	1.732	1.726	.123	.116	.097	.070	.081	.074	.505	.505	.394
3	1.832	1.809	1.827	.176	.166	.176	.162	.158	.175	.572	.572	.596
4	2.736	3.028	2.728	.860	.994	.771	1.070	1.372	1.080	4.208	4.208	3.871

$I = 15$ DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.655	1.637	1.640	.076	.060	.071						
2	1.693	1.686	1.694	.093	.091	.086	.038	.049	.054	.394	.394	.237
3	1.797	1.781	1.807	.148	.192	.146	.142	.144	.167	.587	1.082	.498
4	2.600	3.004	2.758	1.084	1.362	1.041	.950	1.373	1.121	3.990	3.990	3.990

$I = 30$ DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.680	1.665	1.642	.075	.072	.069						
2	1.732	1.722	1.714	.121	.103	.116	.052	.057	.072	.598	.405	.598
3	1.806	1.806	1.775	.139	.229	.150	.126	.141	.132	.598	1.083	.598
4	2.664	2.911	3.067	.837	1.134	1.074	.993	1.249	1.425	4.267	4.267	4.093

$I = 45$ DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ									
1	1.665	1.644	1.648	.082	.076	.081						
2	1.713	1.705	1.696	.105	.090	.098	.048	.061	.049	.310	.310	.283
3	1.806	1.810	1.801	.170	.206	.189	.141	.166	.154	.498	.958	.654
4	2.673	3.067	2.682	1.014	1.169	1.006	1.012	1.443	1.039	4.043	4.262	4.043

$I = 60$ DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.723	1.656	1.693	.371	.091	.374						
2	1.779	1.718	1.755	.370	.128	.370	.057	.062	.062	.363	.363	.420
3	1.911	1.841	1.863	.477	.240	.457	.188	.186	.170	.802	.936	.608
4	2.755	2.967	2.892	.948	1.031	1.076	1.033	1.313	1.198	3.616	3.650	3.616

$I = 75$ DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.703	1.674	1.663	.141	.124	.090						
2	1.787	1.749	1.751	.248	.177	.175	.084	.075	.088	.711	.463	.700
3	1.871	1.828	1.826	.278	.240	.198	.168	.155	.163	.711	.768	.700
4	2.615	2.887	2.658	.836	.875	.834	.911	1.245	.998	2.890	3.514	2.890

$I = 90$ DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.668	1.644	1.638	.076	.084	.078						
2	1.714	1.713	1.703	.097	.092	.098	.047	.068	.064	.309	.308	.309
3	1.816	1.821	1.774	.169	.239	.160	.148	.177	.135	.498	.823	.498
4	2.577	2.961	2.777	.927	1.010	1.069	.910	1.324	1.140	3.962	3.962	4.029

APPENDIX B. PDOP RESULTS FOR FIVE GPS OBSERVATIONS

TABLE B1 (H=100 NAUTICAL MILES, L=5 GPS OBSERVATIONS)

I = 0 DEGREES

EST	PDOP				SIGP				AVDF				MAXD			
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA
1	1.638	1.603	1.610	.076	.080	.083										
2	1.750	1.708	1.701	.155	.133	.156	.112	.105	.090	.459	.494	.385				
3	1.778	1.790	1.784	.156	.185	.225	.140	.187	.174	.459	.868	.698				
4	2.416	2.341	2.177	1.120	.952	.958	.778	.743	.582	4.173	4.265	4.322				

I = 15 DEGREES

EST	PDOP				SIGP				AVDF				MAXD			
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA
1	1.648	1.626	1.609	.118	.116	.101										
2	1.744	1.739	1.702	.190	.194	.167	.096	.112	.093	.568	.487	.365				
3	1.796	1.856	1.811	.217	.286	.263	.148	.230	.202	.568	.922	.731				
4	2.385	2.570	2.078	.906	1.113	.644	.736	.952	.486	3.612	4.291	2.295				

I = 30 DEGREES

EST	PDOP				SIGP				AVDF				MAXD			
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA
1	1.606	1.591	1.589	.120	.116	.115										
2	1.696	1.695	1.668	.171	.197	.145	.089	.104	.079	.567	.516	.249				
3	1.756	1.818	1.793	.205	.270	.218	.150	.226	.203	.602	.977	.624				
4	2.102	2.418	2.196	.634	.961	.781	.496	.835	.618	2.725	3.862	3.758				

I = 45 DEGREES

EST	PDOP				SIGP				AVDF				MAXD			
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA
1	1.574	1.553	1.561	.101	.090	.102										
2	1.647	1.653	1.633	.170	.178	.147	.072	.100	.072	.568	.516	.297				
3	1.678	1.730	1.726	.191	.272	.209	.104	.178	.165	.568	.891	.554				
4	1.921	2.006	2.026	.466	.549	.556	.347	.463	.473	1.675	2.410	2.000				

I = 60 DEGREES

EST	PDOP				SIGP				AVDF				MAXD			
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA
1	1.578	1.554	1.555	.097	.099	.090										
2	1.633	1.626	1.634	.136	.142	.141	.055	.072	.080	.316	.278	.322				
3	1.696	1.771	1.745	.175	.263	.198	.118	.217	.190	.483	1.024	.696				
4	1.973	2.173	2.221	.519	.692	.712	.394	.621	.672	2.646	3.359	3.070				

I = 75 DEGREES

EST	PDOP				SIGP				AVDF				MAXD			
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA
1	1.621	1.595	1.581	.109	.106	.084										
2	1.700	1.687	1.658	.146	.149	.124	.079	.092	.077	.233	.409	.317				
3	1.793	1.841	1.796	.195	.257	.217	.172	.247	.215	.630	1.000	.912				
4	2.252	2.422	2.342	.910	.008	.848	.629	.827	.767	4.021	4.018	4.018				

I = 90 DEGREES

EST	PDOP				SIGP				AVDF				MAXD			
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA
1	1.660	1.639	1.589	.166	.163	.088										
2	1.752	1.730	1.694	.194	.191	.138	.092	.091	.106	.299	.283	.276				
3	1.836	1.837	1.811	.225	.237	.198	.176	.198	.223	.670	.670	.700				
4	2.497	2.630	2.366	.905	1.007	.639	.836	.991	.777	3.918	3.346	2.631				

APPENDIX B. (continued)

TABLE B2 (H=200 NAUTICAL MILES, L=5 GPS OBSERVATIONS)

I = 0 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.564	1.545	1.535	.097	.091	.086						
2	1.640	1.628	1.619	.145	.150	.140	.076	.083	.084	.372	.372	.372
3	1.666	1.718	1.712	.154	.204	.223	.102	.173	.177	.372	.619	.708
4	2.035	2.196	2.089	.787	.964	.721	.471	.654	.558	3.489	3.989	2.786

I = 15 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.533	1.522	1.507	.103	.095	.087						
2	1.599	1.598	1.591	.151	.144	.159	.066	.076	.084	.371	.371	.372
3	1.626	1.658	1.666	.164	.192	.215	.093	.137	.159	.371	.560	.719
4	2.059	2.143	2.000	.955	.918	.757	.525	.622	.503	4.311	4.088	3.542

I = 30 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.518	1.506	1.494	.072	.069	.065						
2	1.567	1.568	1.555	.100	.103	.102	.050	.062	.061	.181	.210	.310
3	1.631	1.679	1.649	.139	.189	.169	.114	.173	.155	.515	.810	.557
4	1.858	2.135	2.030	.404	.693	.666	.345	.630	.541	1.735	3.643	3.272

I = 45 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.501	1.484	1.484	.064	.067	.062						
2	1.548	1.543	1.545	.108	.113	.109	.046	.059	.060	.308	.317	.708
3	1.580	1.642	1.689	.125	.212	.266	.079	.158	.204	.468	.772	1.435
4	1.817	2.100	2.041	.429	.811	.652	.316	.621	.556	1.820	3.938	3.300

I = 60 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.506	1.485	1.476	.088	.076	.058						
2	1.555	1.545	1.532	.117	.104	.096	.048	.060	.056	.180	.203	.210
3	1.612	1.678	1.626	.151	.229	.162	.106	.194	.151	.479	1.014	.556
4	1.890	2.141	2.115	.386	.635	.629	.391	.657	.639	1.843	2.857	2.344

I = 75 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.544	1.519	1.509	.094	.082	.073						
2	1.620	1.587	1.575	.144	.123	.117	.076	.068	.066	.336	.198	.240
3	1.724	1.738	1.675	.222	.251	.184	.180	.219	.186	.553	.957	.606
4	2.198	2.438	2.330	.934	1.101	.818	.696	.919	.821	4.259	4.512	3.048

I = 90 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.569	1.527	1.492	.161	.070	.054						
2	1.638	1.598	1.572	.165	.110	.102	.069	.071	.080	.234	.258	.222
3	1.749	1.708	1.655	.242	.201	.163	.180	.182	.163	.575	.529	.552
4	2.270	2.494	2.284	.921	1.206	.789	.703	.968	.792	4.156	4.418	3.048

APPENDIX B. (continued)

TABLE B3 (H=300 NAUTICAL MILES, L=5 GPS OBSERVATIONS)

I = 0 DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.497	1.483	1.477	.073	.071	.064						
2	1.541	1.536	1.527	.099	.091	.107	.044	.053	.051	.094	.171	.261
3	1.554	1.613	1.599	.089	.189	.185	.057	.130	.122	.094	.829	.553
4	1.631	1.777	1.727	.219	.328	.240	.134	.294	.250	.686	.954	.791

I = 15 DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.483	1.466	1.465	.069	.063	.056						
2	1.534	1.521	1.533	.089	.099	.102	.051	.055	.068	.147	.350	.333
3	1.556	1.588	1.612	.099	.164	.164	.073	.122	.147	.193	.864	.553
4	1.692	1.924	1.887	.264	.697	.458	.209	.458	.421	.676	3.754	2.016

I = 30 DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.465	1.451	1.450	.053	.053	.045						
2	1.517	1.515	1.518	.070	.091	.081	.053	.064	.068	.163	.279	.336
3	1.566	1.578	1.623	.094	.148	.156	.101	.127	.174	.355	.561	.556
4	1.778	1.953	2.102	.322	.629	.658	.313	.501	.652	1.290	2.904	3.195

I = 45 DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.456	1.444	1.444	.054	.051	.047						
2	1.499	1.488	1.496	.082	.083	.090	.043	.044	.052	.136	.259	.332
3	1.535	1.530	1.589	.087	.105	.158	.079	.086	.145	.226	.361	.560
4	1.757	1.941	1.932	.395	.632	.565	.301	.498	.488	2.205	4.002	2.678

I = 60 DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.470	1.449	1.455	.071	.061	.061						
2	1.519	1.500	1.513	.099	.094	.104	.049	.051	.058	.256	.228	.324
3	1.585	1.578	1.612	.149	.192	.163	.114	.129	.156	.530	1.031	.565
4	1.863	2.127	2.162	.489	.772	.651	.402	.680	.711	1.876	4.264	4.294

I = 75 DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.516	1.493	1.477	.101	.092	.069						
2	1.577	1.560	1.541	.137	.115	.090	.061	.067	.064	.225	.225	.225
3	1.659	1.669	1.629	.190	.241	.145	.163	.176	.152	.478	.921	.556
4	2.000	2.357	2.349	.686	.856	.968	.489	.871	.874	4.184	2.961	4.248

I = 90 DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.527	1.499	1.474	.080	.074	.052						
2	1.591	1.570	1.551	.131	.111	.091	.064	.070	.077	.374	.276	.258
3	1.693	1.693	1.665	.203	.218	.162	.167	.194	.191	.553	.601	.544
4	2.241	2.517	2.359	.960	1.160	.814	.717	1.019	.885	4.286	4.300	3.211

APPENDIX B. (continued)

TABLE B4 (H=400 NAUTICAL MILES, L=5 GPS OBSERVATIONS)

I = 0 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.479	1.469	1.458	.086	.076	.074						
2	1.539	1.543	1.523	.129	.116	.112	.060	.074	.066	.370	.293	.269
3	1.563	1.605	1.590	.134	.171	.189	.084	.136	.132	.370	.662	.814
4	1.814	1.969	1.876	.755	.826	.472	.335	.500	.422	4.111	4.016	2.053

I = 15 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.456	1.448	1.438	.073	.070	.051						
2	1.502	1.508	1.493	.091	.090	.073	.046	.061	.055	.317	.266	.317
3	1.527	1.579	1.538	.109	.161	.119	.071	.132	.099	.388	.605	.503
4	1.696	1.978	1.823	.461	.952	.432	.240	.531	.386	2.654	4.153	1.967

I = 30 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.444	1.433	1.430	.051	.050	.039						
2	1.490	1.497	1.491	.059	.069	.057	.046	.064	.061	.117	.282	.261
3	1.526	1.583	1.542	.082	.152	.113	.082	.150	.112	.253	.628	.470
4	1.752	1.945	1.933	.418	.753	.500	.308	.512	.504	2.019	3.903	2.027

I = 45 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.442	1.432	1.428	.056	.053	.045						
2	1.483	1.478	1.476	.076	.078	.069	.040	.046	.047	.164	.164	.164
3	1.524	1.554	1.524	.097	.151	.108	.082	.123	.095	.274	.588	.355
4	1.760	2.084	1.954	.442	.783	.700	.317	.652	.525	2.790	3.448	2.977

I = 60 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.450	1.431	1.431	.068	.059	.054						
2	1.496	1.471	1.468	.084	.082	.081	.046	.041	.056	.252	.252	.252
3	1.540	1.545	1.568	.109	.128	.143	.090	.114	.137	.269	.463	.448
4	1.821	1.951	1.974	.454	.691	.560	.372	.523	.563	1.828	1.761	2.161

I = 75 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.475	1.452	1.444	.080	.071	.058						
2	1.536	1.518	1.500	.098	.101	.081	.061	.066	.055	.230	.220	.183
3	1.618	1.662	1.584	.178	.277	.151	.143	.210	.140	.592	1.051	.403
4	2.089	2.196	2.150	.960	.974	.798	.616	.746	.705	4.517	4.552	3.036

I = 90 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.479	1.460	1.448	.072	.064	.056						
2	1.553	1.541	1.521	.094	.085	.098	.074	.082	.073	.234	.285	.236
3	1.644	1.647	1.636	.174	.181	.161	.165	.187	.188	.574	.672	.566
4	2.181	2.380	2.370	.919	1.064	.934	.701	.920	.922	4.234	4.194	3.167

APPENDIX B. (continued)

TABLE B5 (H=500 NAUTICAL MILES, L=5 GPS OBSERVATIONS)

I = 0 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.440	1.429	1.428	.040	.035	.038						
2	1.489	1.481	1.491	.074	.067	.072	.049	.053	.063	.226	.281	.226
3	1.516	1.553	1.585	.073	.146	.180	.076	.124	.157	.323	.565	.624
4	1.614	1.746	1.741	.182	.268	.253	.173	.317	.313	.586	.951	1.267

I = 15 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.632	1.423	1.421	.044	.040	.038						
2	1.472	1.467	1.474	.047	.046	.060	.041	.045	.053	.139	.139	.204
3	1.510	1.526	1.559	.061	.087	.145	.078	.103	.138	.202	.305	.575
4	1.642	1.746	1.787	.221	.238	.327	.210	.326	.366	1.008	1.009	1.934

I = 30 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.420	1.409	1.412	.041	.032	.032						
2	1.462	1.460	1.469	.051	.060	.073	.042	.051	.058	.117	.171	.309
3	1.499	1.505	1.536	.076	.089	.127	.079	.097	.124	.228	.277	.413
4	1.720	1.846	1.838	.405	.453	.439	.300	.437	.426	1.716	2.084	2.226

I = 45 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.413	1.404	1.405	.037	.032	.031						
2	1.450	1.450	1.453	.055	.064	.075	.036	.046	.048	.139	.213	.311
3	1.501	1.512	1.525	.088	.117	.126	.088	.108	.120	.309	.507	.406
4	1.797	1.829	1.889	.530	.412	.570	.384	.424	.484	2.693	1.839	3.102

I = 60 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.426	1.407	1.411	.058	.037	.039						
2	1.473	1.470	1.460	.087	.087	.065	.047	.063	.049	.244	.261	.244
3	1.519	1.554	1.556	.116	.150	.140	.094	.146	.145	.460	.686	.428
4	1.815	2.022	2.027	.516	.625	.779	.389	.616	.616	2.046	2.922	3.421

I = 75 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.433	1.419	1.413	.060	.052	.046						
2	1.494	1.483	1.473	.096	.090	.089	.060	.064	.060	.253	.231	.177
3	1.555	1.576	1.557	.164	.189	.131	.121	.157	.144	.455	.881	.388
4	1.933	2.097	2.089	.803	.915	.981	.501	.679	.672	4.205	4.265	4.413

I = 90 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.455	1.435	1.420	.073	.061	.053						
2	1.523	1.513	1.480	.126	.128	.102	.068	.078	.061	.254	.393	.308
3	1.604	1.624	1.578	.184	.218	.159	.149	.188	.158	.681	.916	.562
4	2.012	2.244	2.038	.749	.804	.732	.557	.808	.618	3.857	3.857	3.890

APPENDIX B. (continued)

TABLE B6 (H=600 NAUTICAL MILES, L=5 GPS OBSERVATIONS)

I = 0 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.424	1.413	1.416	.017	.021	.021						
2	1.465	1.466	1.464	.051	.061	.056	.041	.053	.050	.245	.248	.200
3	1.497	1.527	1.545	.052	.129	.139	.073	.114	.131	.285	.680	.520
4	1.602	1.731	1.719	.174	.294	.230	.178	.318	.305	.806	1.141	.983

I = 15 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.424	1.416	1.411	.041	.042	.033						
2	1.469	1.470	1.466	.060	.063	.074	.045	.054	.054	.242	.242	.316
3	1.496	1.517	1.522	.067	.111	.130	.072	.101	.110	.298	.578	.546
4	1.581	1.744	1.719	.184	.300	.316	.157	.332	.308	.803	1.130	1.902

I = 30 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.414	1.404	1.405	.035	.034	.031						
2	1.454	1.453	1.463	.049	.066	.079	.041	.049	.058	.129	.190	.319
3	1.494	1.480	1.532	.072	.076	.160	.080	.075	.127	.218	.297	.682
4	1.636	1.830	1.835	.281	.572	.509	.222	.426	.429	1.356	3.414	2.280

I = 45 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.408	1.397	1.399	.034	.030	.025						
2	1.442	1.437	1.440	.053	.052	.055	.035	.039	.041	.133	.155	.190
3	1.481	1.495	1.504	.082	.125	.132	.073	.097	.105	.318	.535	.677
4	1.726	1.803	1.822	.496	.433	.567	.318	.406	.423	2.054	1.838	3.314

I = 60 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.413	1.400	1.403	.040	.033	.031						
2	1.458	1.445	1.457	.063	.069	.071	.045	.045	.054	.234	.311	.251
3	1.509	1.544	1.564	.091	.177	.135	.096	.163	.142	.320	.904	.556
4	1.786	1.875	1.906	.500	.439	.528	.371	.474	.506	1.885	1.675	1.964

I = 75 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.419	1.404	1.400	.056	.038	.029						
2	1.463	1.453	1.455	.077	.069	.061	.044	.049	.055	.152	.168	.200
3	1.529	1.528	1.526	.157	.147	.108	.110	.124	.125	.560	.560	.386
4	1.760	1.972	1.922	.460	.846	.653	.348	.570	.521	1.972	4.038	3.539

I = 90 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.443	1.429	1.416	.064	.062	.045						
2	1.502	1.489	1.473	.101	.100	.077	.059	.060	.057	.284	.284	.173
3	1.583	1.581	1.564	.184	.181	.143	.140	.152	.148	.563	.635	.552
4	2.038	2.100	2.043	.898	.770	.707	.595	.672	.627	4.341	4.341	2.918

APPENDIX B. (continued)

TABLE B7 (H=700 NAUTICAL MILES, L=5 GPS OBSERVATIONS)

$I = 0$ DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.415	1.406	1.406	.016	.017	.021						
2	1.449	1.449	1.447	.044	.052	.048	.035	.043	.041	.236	.236	.198
3	1.480	1.494	1.504	.053	.081	.122	.065	.089	.098	.282	.394	.546
4	1.573	1.638	1.668	.158	.201	.237	.158	.232	.262	.784	.806	1.051

$I = 15$ DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.413	1.402	1.400	.038	.022	.023						
2	1.455	1.453	1.454	.057	.055	.073	.043	.051	.053	.247	.237	.357
3	1.485	1.497	1.514	.062	.079	.147	.072	.096	.113	.295	.314	.581
4	1.590	1.713	1.698	.176	.288	.323	.177	.312	.297	.818	1.082	1.871

$I = 30$ DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.397	1.392	1.391	.019	.018	.019						
2	1.439	1.432	1.440	.045	.041	.048	.042	.040	.049	.229	.229	.152
3	1.471	1.474	1.483	.060	.073	.106	.074	.082	.092	.253	.300	.578
4	1.688	1.735	1.691	.419	.348	.283	.290	.343	.300	1.816	1.203	1.406

$I = 45$ DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.399	1.390	1.391	.020	.019	.018						
2	1.427	1.416	1.433	.040	.034	.058	.028	.026	.041	.105	.123	.226
3	1.478	1.460	1.501	.084	.067	.134	.079	.070	.109	.316	.260	.704
4	1.737	1.714	1.727	.466	.344	.292	.338	.324	.335	1.968	1.751	1.306

$I = 60$ DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.398	1.390	1.389	.030	.020	.025						
2	1.443	1.436	1.442	.062	.067	.062	.046	.046	.054	.223	.331	.237
3	1.483	1.484	1.497	.082	.065	.101	.085	.094	.108	.327	.336	.381
4	1.713	1.757	1.835	.453	.417	.596	.316	.367	.446	2.133	2.429	2.626

$I = 75$ DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.408	1.400	1.396	.044	.038	.028						
2	1.460	1.444	1.455	.077	.067	.064	.052	.044	.060	.263	.177	.199
3	1.529	1.515	1.524	.138	.168	.095	.121	.115	.128	.523	1.059	.388
4	1.923	1.739	1.941	.867	.357	.624	.515	.339	.566	4.126	1.537	2.933

$I = 90$ DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.427	1.410	1.404	.052	.046	.046						
2	1.479	1.460	1.458	.086	.072	.081	.052	.050	.054	.238	.196	.237
3	1.557	1.533	1.541	.169	.136	.140	.130	.123	.137	.665	.583	.507
4	1.962	2.000	1.982	.845	.910	.644	.536	.591	.578	3.954	3.957	2.832

APPENDIX B. (continued)

TABLE B8 (H=800 NAUTICAL MILES, L=5 GPS OBSERVATIONS)

$I = 0$ DEGREES

EST	POOP				SIGP				AVDF				MAXD				
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	
1	1.411	1.403	1.402	.015	.014	.021											
2	1.445	1.443	1.448	.030	.033	.049	.034	.040	.046	.121	.130	.167					
3	1.473	1.493	1.505	.037	.096	.125	.062	.090	.102	.140	.450	.490					
4	1.546	1.645	1.626	.134	.246	.184	.135	.242	.223	.542	1.084	.660					

$I = 15$ DEGREES

EST	POOP				SIGP				AVDF				MAXD				
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	
1	1.400	1.394	1.393	.019	.017	.018											
2	1.443	1.437	1.441	.044	.046	.046	.043	.042	.048	.181	.181	.190					
3	1.475	1.482	1.503	.069	.094	.104	.074	.087	.111	.332	.371	.465					
4	1.580	1.654	1.649	.203	.299	.223	.179	.260	.256	.990	1.347	1.020					

$I = 30$ DEGREES

EST	POOP				SIGP				AVDF				MAXD				
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	
1	1.391	1.387	1.388	.019	.016	.018											
2	1.429	1.429	1.431	.036	.040	.037	.038	.043	.044	.159	.173	.143					
3	1.468	1.464	1.476	.063	.062	.058	.077	.078	.088	.296	.308	.218					
4	1.605	1.602	1.796	.327	.251	.612	.213	.216	.409	1.670	1.196	3.045					

$I = 45$ DEGREES

EST	POOP				SIGP				AVDF				MAXD				
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	
1	1.393	1.387	1.387	.020	.019	.017											
2	1.432	1.425	1.425	.044	.046	.037	.039	.038	.037	.165	.160	.196					
3	1.462	1.464	1.477	.077	.091	.092	.069	.077	.089	.405	.420	.346					
4	1.671	1.670	1.760	.438	.324	.616	.278	.283	.372	2.027	1.576	3.131					

$I = 60$ DEGREES

EST	POOP				SIGP				AVDF				MAXD				
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	
1	1.393	1.384	1.385	.020	.019	.020											
2	1.432	1.423	1.430	.049	.052	.057	.039	.040	.045	.213	.213	.234					
3	1.479	1.481	1.492	.077	.081	.093	.086	.097	.107	.379	.343	.405					
4	1.654	1.736	1.813	.460	.400	.539	.261	.352	.428	2.110	2.021	2.718					

$I = 75$ DEGREES

EST	POOP				SIGP				AVDF				MAXD				
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	
1	1.403	1.394	1.389	.042	.036	.023											
2	1.454	1.442	1.439	.073	.063	.054	.051	.048	.050	.197	.197	.191					
3	1.510	1.509	1.525	.142	.120	.096	.107	.115	.136	.554	.472	.345					
4	1.857	1.939	1.965	.778	.634	.597	.456	.565	.556	4.177	4.329	2.737					

$I = 90$ DEGREES

EST	POOP				SIGP				AVDF				MAXD				
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	
1	1.421	1.408	1.398	.066	.054	.041											
2	1.468	1.455	1.443	.086	.077	.062	.047	.067	.045	.189	.189	.244					
3	1.541	1.537	1.532	.169	.161	.129	.120	.129	.134	.554	.638	.542					
4	1.919	1.891	1.920	.908	.563	.687	.499	.483	.522	4.401	2.416	3.138					

APPENDIX B. (continued)

TABLE B9 (H=900 NAUTICAL MILES, L=5 GPS OBSERVATIONS)

$I = 0$ DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.404	1.393	1.393	.013	.014	.017						
2	1.443	1.437	1.435	.031	.037	.040	.039	.044	.042	.108	.144	.101
3	1.465	1.469	1.467	.044	.055	.058	.061	.075	.074	.115	.251	.128
4	1.548	1.593	1.573	.112	.184	.138	.144	.200	.180	.359	.769	.410

$I = 15$ DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.397	1.388	1.390	.019	.016	.019						
2	1.433	1.427	1.435	.045	.043	.047	.036	.039	.046	.119	.119	.123
3	1.456	1.455	1.488	.054	.059	.100	.059	.067	.099	.185	.210	.428
4	1.559	1.573	1.607	.163	.201	.173	.161	.184	.217	.494	.806	.500

$I = 30$ DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.389	1.383	1.383	.021	.016	.019						
2	1.412	1.411	1.422	.021	.032	.039	.022	.028	.038	.058	.174	.157
3	1.450	1.445	1.467	.066	.073	.075	.060	.063	.083	.252	.324	.257
4	1.541	1.624	1.616	.212	.323	.213	.152	.241	.232	1.401	1.937	.968

$I = 45$ DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.387	1.379	1.382	.020	.016	.019						
2	1.421	1.424	1.417	.033	.047	.030	.034	.045	.035	.154	.198	.109
3	1.445	1.476	1.488	.060	.110	.090	.058	.097	.086	.303	.500	.386
4	1.662	1.704	1.737	.520	.405	.516	.275	.324	.355	2.028	2.003	2.657

$I = 60$ DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.390	1.380	1.383	.021	.016	.019						
2	1.415	1.413	1.415	.032	.028	.030	.026	.033	.032	.157	.107	.129
3	1.452	1.465	1.473	.056	.074	.104	.063	.085	.090	.218	.341	.407
4	1.765	1.791	1.796	.564	.451	.550	.356	.411	.615	2.120	2.090	2.694

$I = 75$ DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.397	1.387	1.386	.019	.017	.019						
2	1.419	1.424	1.416	.035	.044	.028	.022	.037	.030	.151	.159	.111
3	1.474	1.493	1.471	.101	.169	.065	.078	.106	.085	.423	.923	.234
4	2.004	2.040	1.926	.901	.879	.647	.608	.653	.537	2.797	2.847	2.690

$I = 90$ DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.393	1.386	1.385	.021	.019	.019						
2	1.432	1.434	1.435	.050	.060	.050	.038	.048	.049	.172	.233	.196
3	1.480	1.489	1.489	.098	.098	.096	.087	.102	.104	.320	.520	.341
4	1.755	1.900	1.813	.662	.709	.676	.361	.514	.428	2.446	2.361	2.451

APPENDIX B. (continued)

TABLE B10 (H=1000 NAUTICAL MILES, L=5 GPS OBSERVATIONS)

I = 0 DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.401	1.393	1.389	.013	.014	.014						
2	1.430	1.425	1.432	.023	.028	.041	.029	.032	.043	.120	.120	.135
3	1.465	1.470	1.472	.044	.069	.070	.065	.077	.083	.136	.366	.318
4	1.540	1.603	1.616	.135	.193	.249	.140	.210	.227	.456	.751	1.251

I = 15 DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.393	1.386	1.386	.016	.015	.015						
2	1.429	1.424	1.429	.032	.042	.044	.036	.038	.044	.114	.148	.133
3	1.466	1.473	1.481	.058	.090	.099	.073	.086	.095	.186	.376	.385
4	1.553	1.650	1.650	.166	.256	.251	.161	.264	.264	.861	1.246	1.323

I = 30 DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.386	1.381	1.381	.015	.013	.014						
2	1.422	1.420	1.426	.029	.038	.044	.037	.039	.045	.116	.170	.195
3	1.459	1.476	1.479	.063	.092	.105	.073	.095	.098	.249	.379	.556
4	1.613	1.716	1.682	.377	.510	.318	.228	.335	.301	1.715	2.634	1.311

I = 45 DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.385	1.378	1.378	.016	.013	.014						
2	1.414	1.417	1.410	.027	.036	.025	.029	.039	.032	.157	.171	.114
3	1.458	1.495	1.461	.073	.109	.088	.073	.117	.083	.366	.506	.424
4	1.572	1.740	1.751	.295	.541	.552	.187	.362	.373	2.006	3.410	2.771

I = 60 DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.386	1.380	1.381	.016	.015	.015						
2	1.421	1.420	1.421	.035	.045	.041	.035	.039	.040	.148	.167	.185
3	1.469	1.494	1.483	.071	.140	.112	.083	.114	.102	.306	.780	.442
4	1.663	1.859	1.691	.451	.650	.423	.277	.478	.310	2.094	3.123	2.671

I = 75 DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.393	1.387	1.383	.022	.020	.016						
2	1.436	1.436	1.428	.058	.057	.047	.044	.049	.045	.188	.188	.200
3	1.474	1.499	1.481	.115	.167	.086	.081	.112	.098	.660	1.029	.360
4	1.646	1.861	1.772	.437	.690	.501	.253	.475	.389	2.152	3.502	2.505

I = 90 DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.391	1.387	1.381	.023	.021	.017						
2	1.440	1.440	1.428	.057	.063	.048	.049	.053	.046	.189	.189	.168
3	1.491	1.500	1.494	.102	.105	.083	.100	.113	.112	.427	.342	.311
4	1.709	1.876	1.771	.583	.715	.514	.319	.490	.389	3.595	3.595	3.069

APPENDIX B. (continued)

TABLE B11 (H=1200 NAUTICAL MILES, L=5 GPS OBSERVATIONS)

I = 0 DEGREES

EST	POOP				SIGP				AVDF				MAXD				
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	
1	1.392	1.384	1.384	.012	.011	.012											
2	1.422	1.419	1.424	.032	.038	.050	.030	.034	.041	.133	.143	.179					
3	1.446	1.443	1.456	.043	.048	.074	.053	.059	.073	.144	.181	.376					
4	1.482	1.544	1.622	.089	.206	.249	.089	.160	.238	.413	1.122	1.241					

I = 15 DEGREES

EST	POOP				SIGP				AVDF				MAXD				
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	
1	1.383	1.379	1.378	.015	.012	.015											
2	1.419	1.415	1.420	.029	.032	.044	.036	.036	.042	.097	.123	.146					
3	1.442	1.445	1.472	.045	.050	.102	.059	.067	.094	.154	.165	.541					
4	1.495	1.566	1.612	.112	.152	.248	.111	.187	.234	.442	.623	1.209					

I = 30 DEGREES

EST	POOP				SIGP				AVDF				MAXD				
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	
1	1.381	1.375	1.376	.013	.010	.013											
2	1.412	1.405	1.415	.032	.030	.036	.030	.029	.039	.115	.159	.425					
3	1.446	1.442	1.467	.057	.053	.102	.065	.066	.091	.241	.241	.527					
4	1.528	1.641	1.621	.179	.576	.255	.146	.266	.245	.755	4.059	1.194					

I = 45 DEGREES

EST	POOP				SIGP				AVDF				MAXD				
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	DA	IP	EQ	BA	IP	EQ	BA	
1	1.382	1.376	1.376	.014	.011	.013											
2	1.410	1.404	1.412	.031	.030	.037	.028	.028	.036	.135	.114	.128					
3	1.460	1.458	1.475	.078	.079	.109	.078	.082	.099	.358	.361	.521					
4	1.608	1.718	1.775	.386	.398	.602	.227	.342	.399	2.005	2.008	3.417					

I = 60 DEGREES

EST	POOP				SIGP				AVDF				MAXD				
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	
1	1.383	1.376	1.376	.014	.013	.013											
2	1.411	1.408	1.413	.027	.028	.039	.028	.031	.037	.111	.111	.197					
3	1.461	1.463	1.492	.067	.076	.128	.078	.087	.116	.293	.300	.522					
4	1.609	1.764	1.831	.476	.422	.631	.306	.387	.456	2.179	2.186	3.572					

I = 75 DEGREES

EST	POOP				SIGP				AVDF				MAXD				
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	
1	1.385	1.378	1.378	.016	.015	.016											
2	1.425	1.416	1.430	.048	.045	.051	.040	.038	.053	.184	.203	.402					
3	1.459	1.456	1.496	.069	.066	.099	.074	.070	.118	.241	.234	.466					
4	1.673	1.760	1.797	.378	.370	.384	.268	.301	.419	2.150	1.259	2.448					

I = 90 DEGREES

EST	POOP				SIGP				AVDF				MAXD				
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	
1	1.390	1.384	1.381	.022	.018	.019											
2	1.432	1.421	1.436	.047	.042	.057	.042	.037	.055	.183	.158	.215					
3	1.482	1.469	1.517	.092	.069	.102	.092	.086	.138	.327	.256	.467					
4	1.811	1.883	1.865	.770	.713	.590	.421	.499	.485	3.675	3.655	2.783					

APPENDIX B. (continued)

TABLE B12 (H=1600 NAUTICAL MILES, L=5 GPS OBSERVATIONS)

I = 0 DEGREES

EST	PDOP				SIGP				AVDF				MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.385	1.380	1.380	.012	.011	.009									
2	1.405	1.403	1.403	.027	.031	.039	.020	.023	.024	.126	.126	.151			
3	1.431	1.439	1.437	.039	.053	.055	.046	.059	.058	.136	.231	.223			
4	1.459	1.543	1.552	.057	.178	.164	.074	.163	.172	.394	.644	.621			

I = 15 DEGREES

EST	PDOP				SIGP				AVDF				MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.381	1.376	1.378	.014	.010	.013									
2	1.410	1.405	1.411	.031	.028	.039	.029	.029	.033	.102	.113	.151			
3	1.446	1.451	1.452	.052	.078	.089	.065	.075	.075	.185	.467	.453			
4	1.504	1.582	1.575	.130	.237	.183	.123	.205	.197	.454	.943	.616			

I = 30 DEGREES

EST	PDOP				SIGP				AVDF				MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.376	1.373	1.374	.011	.009	.010									
2	1.408	1.407	1.414	.028	.027	.040	.032	.034	.040	.096	.110	.172			
3	1.445	1.449	1.462	.048	.080	.087	.069	.076	.088	.238	.479	.460			
4	1.514	1.593	1.603	.116	.216	.196	.137	.220	.229	.434	1.080	.798			

I = 45 DEGREES

EST	PDOP				SIGP				AVDF				MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.373	1.370	1.370	.010	.008	.008									
2	1.403	1.398	1.410	.024	.029	.036	.030	.028	.040	.088	.131	.151			
3	1.451	1.440	1.468	.066	.055	.081	.078	.070	.098	.265	.214	.388			
4	1.551	1.616	1.807	.166	.248	.577	.179	.246	.438	.901	1.370	3.081			

I = 60 DEGREES

EST	PDOP				SIGP				AVDF				MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.374	1.371	1.371	.011	.009	.010									
2	1.407	1.403	1.411	.030	.029	.038	.033	.032	.040	.102	.102	.151			
3	1.460	1.466	1.473	.063	.085	.089	.065	.095	.102	.232	.303	.425			
4	1.635	1.830	1.969	.351	.703	.743	.261	.459	.597	2.246	3.621	3.060			

I = 75 DEGREES

EST	PDOP				SIGP				AVDF				MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.377	1.374	1.373	.013	.012	.010									
2	1.423	1.426	1.427	.046	.049	.048	.046	.052	.054	.179	.193	.192			
3	1.460	1.477	1.503	.060	.095	.135	.082	.104	.130	.208	.592	.580			
4	1.612	1.732	1.873	.355	.407	.546	.235	.359	.500	2.318	2.246	2.431			

I = 90 DEGREES

EST	PDOP				SIGP				AVDF				MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.380	1.378	1.375	.020	.019	.016									
2	1.419	1.415	1.425	.039	.034	.052	.039	.037	.050	.143	.106	.182			
3	1.464	1.485	1.507	.078	.095	.118	.084	.107	.132	.317	.456	.500			
4	1.705	1.854	1.783	.680	.602	.484	.325	.476	.408	3.529	2.512	2.747			

APPENDIX B. (continued)

TABLE B13 (H=1600 NAUTICAL MILES, L=5 GPS OBSERVATIONS)

I = 0 DEGREES

EST	PDOP				SIGP				AVDF				MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.379	1.376	1.375	.008	.007	.009									
2	1.390	1.392	1.402	.016	.021	.034	.012	.016	.027	.047	.088	.145			
3	1.416	1.418	1.430	.032	.037	.048	.037	.043	.055	.133	.168	.176			
4	1.454	1.515	1.562	.094	.148	.213	.075	.140	.187	.404	.792	.788			

I = 15 DEGREES

EST	PDOP				SIGP				AVDF				MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.377	1.373	1.372	.012	.009	.009									
2	1.406	1.405	1.414	.029	.028	.044	.029	.032	.042	.124	.112	.193			
3	1.432	1.444	1.460	.049	.053	.095	.055	.070	.088	.190	.235	.485			
4	1.496	1.643	1.587	.122	.307	.238	.119	.270	.215	.510	1.709	1.023			

I = 30 DEGREES

EST	PDOP				SIGP				AVDF				MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.376	1.373	1.371	.010	.009	.007									
2	1.398	1.394	1.403	.022	.022	.034	.022	.022	.032	.079	.088	.165			
3	1.428	1.430	1.446	.049	.054	.080	.052	.058	.075	.187	.214	.481			
4	1.511	1.604	1.580	.172	.283	.214	.135	.231	.210	.991	1.591	1.001			

I = 45 DEGREES

EST	PDOP				SIGP				AVDF				MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.375	1.371	1.370	.011	.009	.008									
2	1.401	1.402	1.408	.024	.030	.033	.026	.031	.039	.115	.133	.145			
3	1.439	1.446	1.458	.057	.075	.080	.064	.074	.088	.232	.409	.408			
4	1.556	1.702	1.704	.237	.372	.570	.181	.331	.334	.909	1.490	3.524			

I = 60 DEGREES

EST	PDOP				SIGP				AVDF				MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.374	1.370	1.369	.010	.008	.007									
2	1.406	1.402	1.412	.030	.028	.035	.032	.032	.042	.116	.146	.145			
3	1.454	1.450	1.480	.063	.106	.131	.080	.080	.111	.249	.713	.904			
4	1.670	1.731	1.948	.379	.667	.722	.296	.361	.579	2.214	4.396	3.443			

I = 75 DEGREES

EST	PDOP				SIGP				AVDF				MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.375	1.372	1.369	.011	.009	.008									
2	1.410	1.404	1.417	.036	.036	.043	.035	.033	.048	.138	.128	.161			
3	1.441	1.444	1.499	.055	.052	.107	.066	.072	.130	.315	.254	.444			
4	1.603	1.590	1.832	.379	.203	.531	.228	.218	.462	2.310	.902	2.426			

I = 90 DEGREES

EST	PDOP				SIGP				AVDF				MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.379	1.376	1.373	.018	.017	.015									
2	1.418	1.417	1.422	.040	.042	.045	.039	.041	.049	.180	.180	.170			
3	1.452	1.457	1.510	.063	.067	.122	.073	.081	.137	.242	.244	.481			
4	1.676	1.829	1.806	.639	.761	.583	.297	.453	.433	3.848	3.859	3.336			

APPENDIX B. (continued)

TABLE B14 (H=1800 NAUTICAL MILES, L=5 GPS OBSERVATIONS)

$\lambda = 0$ DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.373	1.372	1.371	.009	.009	.008						
2	1.387	1.390	1.388	.016	.023	.021	.013	.018	.017	.060	.117	.099
3	1.410	1.429	1.419	.027	.050	.039	.037	.057	.047	.083	.222	.134
4	1.470	1.512	1.600	.184	.154	.323	.096	.140	.229	.951	.669	2.031

$\lambda = 15$ DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.376	1.373	1.373	.012	.010	.010						
2	1.398	1.401	1.404	.022	.028	.029	.022	.028	.030	.071	.128	.117
3	1.419	1.460	1.437	.037	.193	.057	.042	.087	.063	.134	1.332	.296
4	1.480	1.606	1.604	.111	.299	.317	.103	.233	.230	.461	1.588	2.015

$\lambda = 30$ DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.374	1.372	1.371	.008	.008	.007						
2	1.399	1.405	1.410	.026	.032	.038	.025	.033	.039	.099	.142	.137
3	1.432	1.456	1.454	.053	.076	.068	.058	.084	.084	.245	.325	.294
4	1.486	1.561	1.640	.105	.203	.418	.112	.189	.270	.400	1.114	2.905

$\lambda = 45$ DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.372	1.370	1.370	.008	.006	.007						
2	1.399	1.399	1.402	.026	.030	.029	.027	.030	.032	.145	.153	.130
3	1.442	1.459	1.457	.062	.092	.079	.069	.089	.087	.225	.558	.424
4	1.563	1.655	1.715	.219	.310	.499	.191	.285	.345	1.019	1.514	2.814

$\lambda = 60$ DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.373	1.370	1.369	.009	.008	.006						
2	1.405	1.397	1.406	.027	.026	.035	.032	.027	.037	.155	.149	.140
3	1.438	1.441	1.473	.056	.055	.111	.065	.070	.103	.287	.214	.455
4	1.595	1.620	1.853	.255	.247	.709	.222	.250	.484	1.038	1.014	3.375

$\lambda = 75$ DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.372	1.370	1.369	.007	.006	.006						
2	1.413	1.403	1.416	.032	.036	.043	.041	.034	.047	.134	.175	.142
3	1.453	1.459	1.468	.061	.092	.124	.081	.089	.119	.319	.459	.449
4	1.637	1.706	1.807	.383	.434	.646	.265	.336	.438	2.275	2.076	3.868

$\lambda = 90$ DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.374	1.372	1.371	.009	.008	.009						
2	1.415	1.400	1.419	.041	.028	.047	.041	.028	.049	.183	.106	.181
3	1.442	1.442	1.492	.048	.060	.119	.068	.070	.121	.188	.254	.445
4	1.572	1.657	1.694	.226	.310	.262	.197	.285	.323	.925	1.138	1.170

APPENDIX B. (continued)

TABLE B15 (H=2000 NAUTICAL MILES, L=5 GPS OBSERVATIONS)

I = 0 DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.387	1.379	1.383	.021	.015	.018						
2	1.435	1.433	1.425	.062	.057	.043	.048	.054	.043	.227	.216	.185
3	1.497	1.502	1.465	.124	.133	.086	.110	.123	.082	.449	.593	.441
4	1.787	1.868	1.664	.488	.551	.316	.400	.489	.282	1.609	2.471	1.568

I = 15 DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.384	1.376	1.378	.018	.012	.015						
2	1.413	1.413	1.414	.029	.042	.034	.029	.037	.036	.123	.233	.114
3	1.448	1.475	1.458	.065	.194	.083	.064	.100	.079	.409	1.362	.414
4	1.578	1.708	1.640	.237	.389	.341	.194	.332	.262	1.065	1.668	1.682

I = 30 DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.384	1.379	1.376	.015	.013	.012						
2	1.415	1.418	1.414	.033	.060	.031	.031	.039	.037	.125	.144	.114
3	1.448	1.451	1.461	.078	.064	.087	.064	.072	.084	.402	.378	.411
4	1.686	1.731	1.745	.415	.405	.404	.302	.392	.369	1.928	1.760	2.013

I = 45 DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.385	1.378	1.376	.015	.013	.012						
2	1.419	1.421	1.414	.034	.049	.035	.034	.042	.038	.137	.283	.157
3	1.469	1.497	1.476	.088	.146	.089	.084	.119	.099	.329	.813	.386
4	1.667	1.872	1.722	.338	.584	.320	.282	.493	.346	1.461	3.197	1.564

I = 60 DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.386	1.381	1.379	.016	.016	.014						
2	1.421	1.415	1.428	.034	.053	.041	.036	.035	.048	.113	.095	.163
3	1.453	1.463	1.490	.068	.100	.137	.067	.083	.110	.351	.701	.828
4	1.707	1.742	1.909	.505	.652	.756	.322	.361	.529	2.279	4.462	3.669

I = 75 DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.386	1.382	1.378	.022	.021	.015						
2	1.436	1.436	1.444	.073	.070	.065	.051	.054	.065	.329	.329	.281
3	1.487	1.502	1.500	.093	.173	.092	.101	.120	.122	.343	1.169	.391
4	1.752	1.848	2.031	.513	.561	.839	.366	.466	.653	2.474	2.849	3.797

I = 90 DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.388	1.383	1.378	.026	.017	.012						
2	1.439	1.442	1.430	.048	.060	.046	.051	.060	.052	.204	.251	.190
3	1.472	1.494	1.490	.078	.121	.133	.084	.111	.112	.342	.569	.665
4	1.660	1.713	1.778	.398	.414	.474	.271	.330	.400	2.447	2.447	2.447

APPENDIX B. (continued)

TABLE B16 (H=2200 NAUTICAL MILES, L=5 GPS OBSERVATIONS)

I = 0 DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.426	1.418	1.421	.034	.037	.035						
2	1.484	1.495	1.474	.077	.100	.054	.058	.077	.054	.270	.402	.209
3	1.524	1.571	1.538	.095	.132	.119	.097	.153	.117	.314	.521	.438
4	1.675	1.851	1.833	.249	.393	.422	.248	.433	.412	.792	1.520	1.744

I = 15 DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.412	1.404	1.403	.032	.031	.030						
2	1.441	1.451	1.449	.048	.057	.046	.028	.048	.046	.135	.187	.145
3	1.486	1.526	1.522	.098	.125	.114	.073	.122	.120	.372	.508	.528
4	1.625	1.811	1.810	.266	.454	.402	.212	.406	.408	1.227	2.155	1.840

I = 30 DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.409	1.399	1.394	.031	.027	.025						
2	1.455	1.463	1.448	.056	.064	.054	.046	.064	.053	.207	.295	.177
3	1.489	1.565	1.516	.094	.270	.141	.080	.167	.122	.329	1.508	.593
4	1.620	1.928	1.767	.206	.605	.372	.211	.529	.372	.736	3.333	1.379

I = 45 DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.409	1.399	1.397	.024	.020	.022						
2	1.466	1.465	1.456	.057	.063	.056	.057	.066	.060	.238	.266	.247
3	1.525	1.545	1.550	.095	.152	.137	.116	.146	.153	.363	.891	.690
4	1.820	1.979	1.958	.373	.540	.594	.411	.580	.561	1.493	2.400	3.785

I = 60 DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.428	1.407	1.404	.095	.034	.032						
2	1.472	1.463	1.453	.101	.071	.052	.043	.057	.049	.205	.241	.167
3	1.541	1.536	1.526	.138	.132	.123	.113	.129	.122	.348	.512	.507
4	1.868	2.080	2.098	.445	.770	.917	.440	.674	.694	2.202	4.228	3.666

I = 75 DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.429	1.416	1.415	.052	.049	.046						
2	1.495	1.497	1.478	.099	.098	.083	.065	.081	.063	.264	.264	.264
3	1.572	1.592	1.568	.141	.154	.138	.142	.175	.153	.436	.610	.555
4	1.868	1.963	1.970	.459	.534	.501	.438	.547	.556	2.220	2.013	2.225

I = 90 DEGREES

EST	PDOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.422	1.407	1.407	.045	.033	.029						
2	1.477	1.474	1.464	.083	.085	.066	.055	.068	.057	.265	.308	.200
3	1.537	1.589	1.525	.127	.216	.124	.115	.163	.118	.510	.933	.504
4	1.865	2.029	1.884	.528	.789	.551	.423	.623	.478	2.207	3.120	2.207

APPENDIX B. (continued)

TABLE B17 (H=2400 NAUTICAL MILES, L=5 GPS OBSERVATIONS)

I = 0 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.453	1.443	1.446	.045	.042	.040						
2	1.517	1.524	1.509	.077	.095	.065	.064	.081	.063	.307	.479	.307
3	1.571	1.596	1.581	.114	.136	.127	.118	.154	.135	.354	.575	.465
4	1.799	2.020	1.961	.270	.644	.439	.347	.577	.516	.938	3.986	1.916

I = 15 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.444	1.430	1.432	.051	.043	.046						
2	1.482	1.484	1.480	.078	.081	.070	.038	.054	.048	.316	.316	.212
3	1.543	1.576	1.575	.124	.204	.150	.099	.146	.143	.398	1.210	.542
4	1.734	2.087	1.965	.376	.926	.663	.290	.658	.533	1.717	4.333	3.592

I = 30 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.460	1.447	1.439	.056	.051	.048						
2	1.501	1.509	1.496	.077	.074	.080	.041	.062	.057	.322	.346	.322
3	1.562	1.632	1.571	.118	.228	.134	.102	.185	.132	.392	1.219	.574
4	1.798	2.191	2.086	.329	.954	.892	.338	.745	.647	1.404	4.389	3.865

I = 45 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.452	1.435	1.442	.060	.054	.057						
2	1.488	1.507	1.479	.083	.088	.082	.036	.072	.038	.212	.227	.212
3	1.532	1.628	1.545	.100	.232	.149	.080	.193	.103	.388	1.099	.675
4	1.693	2.230	1.818	.265	.969	.639	.241	.794	.376	1.206	4.390	1.665

I = 60 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.512	1.452	1.493	.361	.077	.362						
2	1.562	1.517	1.540	.361	.124	.360	.050	.065	.047	.330	.355	.237
3	1.653	1.631	1.621	.396	.250	.378	.141	.179	.129	.784	1.006	.594
4	1.924	2.142	1.976	.571	.614	.687	.412	.690	.481	2.212	2.212	3.281

I = 75 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.481	1.461	1.459	.119	.101	.074						
2	1.543	1.524	1.517	.165	.128	.099	.062	.063	.058	.264	.242	.268
3	1.608	1.626	1.583	.213	.236	.151	.126	.165	.124	.567	.850	.502
4	1.893	2.164	1.961	.592	.752	.611	.412	.703	.501	2.429	2.761	2.429

I = 90 DEGREES

EST	POOP			SIGP			AVDF			MAXD		
	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ	BA	IP	EQ
1	1.456	1.443	1.436	.063	.059	.051						
2	1.508	1.514	1.488	.094	.095	.073	.053	.071	.052	.302	.331	.215
3	1.559	1.612	1.534	.131	.242	.106	.103	.169	.098	.361	.935	.361
4	1.777	2.060	1.807	.443	.731	.448	.322	.616	.370	2.349	3.247	2.373